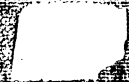
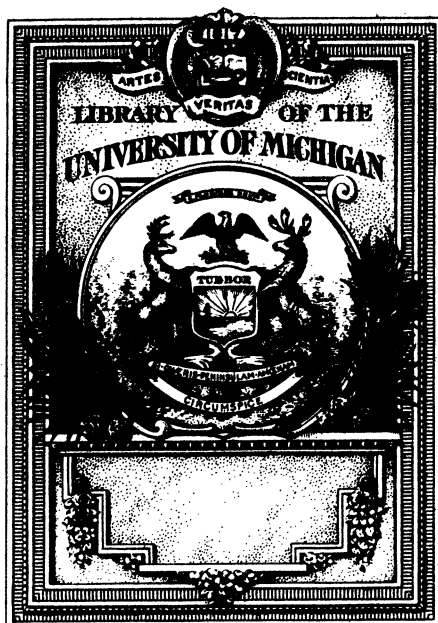


UNITED STATES  
PRELIMINARY REPORT  
OF THE  
FACTORY  
INVESTIGATION  
COMMISSION  
1912  
VOLUME I

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STATE OF NEW YORK

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PRELIMINARY REPORT

OF THE

FACTORY INVESTIGATING COMMISSION

1912

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VOLUME I

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TRANSMITTED TO THE LEGISLATURE MARCH 1, 1912

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ALBANY  
THE ARGUS COMPANY, PRINTERS  
1912



# STATE OF NEW YORK

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No. 30

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## IN SENATE

MARCH 1, 1912

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### PRELIMINARY REPORT

of the

### FACTORY INVESTIGATING COMMISSION

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ROBERT F. WAGNER

Chairman

CHARLES M. HAMILTON

ALFRED E. SMITH

EDWARD D. JACKSON

CYRUS W. PHILLIPS

SIMON BRENTANO

ROBERT E. DOWLING

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SAMUEL GOMPERS

Commission

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Chief Counsel

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Of Counsel



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1912*

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### VOLUME II

#### MINUTES OF PUBLIC HEARINGS:

WITNESSESS EXAMINED.  
TESTIMONY.



## ACT CREATING COMMISSION

CHAP. 561. LAWS OF 1911.

AN ACT to create a commission to investigate the conditions under which manufacturing is carried on in cities of the first and second class in this state, and making an appropriation therefor. Became a law June 30, 1911, with the approval of the Governor. Passed, three-fifths being present.

*The People of the State of New York, represented in Senate and Assembly, do enact as follows:*

Section 1. A commission of nine members is hereby created consisting of two senators to be appointed by the president of the senate, three members of the assembly, and four other members to be appointed by the Governor. Such commission shall investigate as speedily as possible the existing conditions under which manufacture is carried on in so-called loft buildings and otherwise in the cities of the first and second class in the state, including in such investigation, matters affecting the health and safety of operatives as well as the security and best interests of the public, the character of the buildings and structures in which such manufacture or other business takes place and the laws and ordinances now regulating their erection, maintenance and supervision, to the end, among other things, that such remedial legislation may be enacted as will eliminate existing peril to the life and health of operatives and other occupants in existing or new structures, and to promote the best interests of the community. Such commission shall also have the power to inquire into the conditions under which manufacture takes place in other cities of this state and country if it shall so determine.

Sec. 2. The commission shall have power to elect its chairman and other officers, to compel the attendance of witnesses and the production of books and papers; to employ counsel, a secretary, stenographers and all necessary clerical assistants; and shall otherwise have all the powers of a legislative committee as provided

by the legislative law, including the adoption of rules for the conduct of its proceedings. The members of such commission shall receive no compensation for their services, but shall be entitled to their actual and necessary expenses incurred in the performance of their duties.

Sec. 3. Such commission shall make a report of its proceedings, together with its recommendations, to the legislature on or before the fifteenth day of February, nineteen hundred and twelve.

Sec. 4. The sum of ten thousand dollars (\$10,000) or so much thereof as may be needed, is hereby appropriated for the actual and necessary expenses of the commission in carrying out the provisions of this act, payable by the treasurer on the warrant of the comptroller, on the order of the chairman of such commission. The commission may also receive and expend for the purposes of this act any money contributed by voluntary subscription.

Sec. 5. This act shall take effect immediately.

**R E P O R T**  
to the  
**LEGISLATURE OF THE STATE OF NEW YORK**  
by the  
**NEW YORK STATE FACTORY INVESTIGATING COMMISSION**  
(Chapter 561, Laws of 1911)

---

TO THE LEGISLATURE OF THE STATE OF NEW YORK:

The Commission appointed under Chapter 561 of the Laws of 1911, to inquire into the conditions under which manufacturing is carried on in the cities of the first and second class of the State, hereby submits the following PRELIMINARY REPORT:

**CREATION OF COMMISSION.**

On Saturday afternoon, March 25, 1911, a fire took place in the business establishment of the Triangle Waist Company, at No. 23-29 Washington Place, in the Borough of Manhattan, City of New York, in which 145 employees, mainly women and girls, lost their lives.

This shocking loss of life aroused the community to a full sense of its responsibility. A superficial examination revealed conditions in factories and manufacturing establishments that constituted a daily menace to the lives of the thousands of working men, women and children. Lack of precautions to prevent fire, inadequate fire-escape facilities, insanitary conditions that were insidiously undermining the health of the workers were found existing everywhere. The need of a thorough and extensive investigation into the general conditions of factory life was clearly recognized.

Public-spirited citizens and representatives from the Fifth Avenue Association of the City of New York, the Committee on Safety of the City of New York and other organizations laid these facts before the Governor and Legislature of the State and asked for the appointment of a legislative commission to inquire into the conditions under which manufacturing was carried on in the cities of the first and second class of the State. As a result, the Act creating this Commission (Chapter 561 of the Laws of 1911) was passed and became a law on June 30, 1911.

Pursuant to the provisions of that Act, the following Commission was appointed:

SENATOR ROBERT F. WAGNER,

SENATOR CHARLES M. HAMILTON.

By the President of the Senate.

ASSEMBLYMAN ALFRED E. SMITH,

ASSEMBLYMAN EDWARD D. JACKSON,

ASSEMBLYMAN CYRUS W. PHILLIPS.

By the Speaker of the Assembly.

MR. SIMON BRENTANO,

MR. ROBERT E. DOWLING,

MR. SAMUEL GOMPERS,

MISS MARY E. DREIER.

By the Governor.

The Commission was authorized by the Legislature to inquire into the existing conditions under which manufacturing was carried on in so-called loft buildings and otherwise, including matters affecting the health and safety of the operatives as well as the security and best interests of the public, the character of the buildings and structures in which such manufacturing and business takes place, and the laws and ordinances regulating their erection, maintenance and supervision so that, among other things, remedial legislation might be enacted to eliminate existing peril to life and health of operatives and occupants in existing or new structures and to promote the best interests of the community.

The Commission was required to report to the Legislature on or before the 15th day of February, 1912.

The Commission was authorized to compel the attendance of witnesses, the production of books and papers, and to appoint counsel, a secretary, stenographers and necessary clerical assistants, and was otherwise to have all the powers of a legislative committee.

The members of the Commission were to receive no compensation for their services but were to be reimbursed for their actual and necessary expenses. The sum of \$10,000 was appropriated for the expenses of the Commission.

#### ORGANIZATION OF COMMISSION.

The Commission organized on the 17th day of August, 1911, by electing Hon Robert F. Wagner, Chairman, and Hon. Alfred



E. Smith, Vice-Chairman, and by selecting Mr. Frank A. Tierney, as Secretary. The Commission appointed Mr. Abram I. Elkus, Chief Counsel, and Mr. Bernard L. Shientag as his assistant.

Through the generosity of the Committee on Safety of the City of New York and Mr. Robert E. Dowling, a member of this Commission, offices were furnished to the Commission without charge, for which kindness the Commission expresses its thanks and appreciation.

The Commission retained as its expert in general charge of the work of inspection and sanitation, Dr. George M. Price, a physician of standing, practising in the City of New York, who had made investigations of a similar nature, and who is the author of several well-known text-books on sanitation.

Dr. Price, immediately upon being retained, on September 15, 1911, organized a corps of inspectors for field work in the cities of the first and second class of the State

The Commission selected as its advisory expert on the fire problem, Mr. H. F. J. Porter, a mechanical engineer of the City of New York, who had made a study of fire problems, had written many articles on the subject and was known to be conversant with the situation. Under his supervision, inspections were made of numerous manufacturing establishments with reference to the fire hazard.

For the inspection work and fees of the advisory experts, the sum of \$5,500 was expended by the Commission. Both Mr. Porter and Dr. Price agreed to give their own services for practically nominal sums, and both devoted themselves zealously to the work of the Commission.

#### SCOPE OF THE INVESTIGATION

The Commission was charged with the duty of inquiring into the following matters:

1. Hazard to life because of fire: covering fire prevention, arrangement of machinery, fire drills, inadequate fire-escapes and exits, number of persons employed in factories and lofts, etc.
2. Danger to life and health because of insanitary conditions: ventilation, lighting and heating arrangement, hours of labor, etc.

3. Occupational diseases: industrial consumption, lead poisoning, bone disease, etc.

4. Proper and adequate inspection of factories and manufacturing establishments.

5. Manufacturing in tenement houses.

6. The present statutes and ordinances that deal with or relate to the foregoing matters, and the extent to which the present laws are enforced.

The Commission was to recommend such new legislation as might be found necessary to remedy defects in existing legislation, and to provide for conditions at present unregulated.

The Act creating this Commission limited the scope of its inquiry to cities of the first and second class, although the Commission was authorized to inquire into the conditions surrounding manufacturing in other cities of the State and country if it should so determine.

#### IMPORTANCE OF INVESTIGATION.

New York is the first State in the Union to authorize a general investigation of the conditions in manufacturing establishments within its borders. Several other States have appointed commissions which were limited in the scope of their investigations, such as the Illinois Commission on the subject of occupational diseases, the Massachusetts Commission on Factory Inspection and the various Commissions on accident prevention and employers' liability. It remained for the State of New York to lead the way with an investigation of factory conditions, general in its scope and character.

According to the preliminary report of the Census of 1910 there were 1,003,981 men, women and children employed in the factories and manufacturing establishments of New York State. This is the average of the number employed during the year. The Commissioner of Labor gives the number of such employees as over 1,250,000. The following schedule from the United States Census Report of 1910 shows the number of establishments, the capital employed, cost of materials used, salaries paid, value of products and number of wage earners and clerks in the cities of the first and second class in the State, together with their totals:

# REPORT OF COMMISSION.

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## MANUFACTURES IN NEW YORK STATE—CITIES OF THE FIRST AND SECOND CLASS.

	GREATER NEW YORK	BUFFALO	ROCHESTER	SYRACUSE	UTICA	SCHENECTADY	TROY	ALBANY	YONKERS	TOTAL 1st and 2d CITIES IN NEW YORK STATE
No. of establishments.....	25,938	1,752	1,203	739	317	134	363	395	158	30,999
Capital.....	\$1,364,353,000	\$192,871,000	\$95,708,000	\$51,744,000	\$27,796,000	\$51,816,000	\$69,309,000	\$26,276,000	\$58,769,000	\$1,912,632,000
Cost of materials used.....	1,092,155,000	136,120,000	50,674,000	21,781,000	16,646,000	21,952,000	15,626,000	10,521,000	43,202,000	1,408,677,000
Salaries and wages.....	445,772,000	38,052,000	29,252,000	13,737,000	7,513,000	13,088,000	11,602,000	6,815,000	8,024,000	837,123,000
Miscellaneous expenses.....	266,034,000	20,402,000	14,432,000	5,794,000	3,173,000	2,362,000	4,861,000	3,332,000	3,265,000	323,655,000
Value of products.....	2,029,693,000	218,283,000	112,676,000	49,444,000	31,199,000	38,165,000	37,980,000	22,826,000	59,334,000	2,599,600,000
Value added by manufacture..	937,538,000	82,163,000	62,002,000	27,663,000	14,553,000	16,213,000	22,354,000	12,325,000	16,132,000	190,943,000
EMPLOYEES:										
No. salaried officials and clerks	97,453	8,339	0,467	12,907	1,205	2,677	1,777	1,336	885	123,046
Average No. of wage earners..	554,002	51,393	39,108	18,151	13,153	14,931	20,020	9,681	12,711	733,150

In addition to the actual wage earners concerned, the Commission's inquiry bears indirectly upon the millions of women and children who compose the families of these workers and are dependent upon them for support.

Health is the principal asset of the working man and the working woman. The State is bound to do everything in its power to preserve the health of the workers who contribute so materially to its economic wealth and its industrial prosperity.

Aside from the humanitarian aspect of the situation, economic considerations demand from the State the careful supervision and protection of its workers. Failure to perform this obligation will produce serious results in the workers of the future. It will affect the working capacity of the future generation.

The State not only possesses the power and the right, but it is charged with the sacred duty of seeing that the worker is properly safeguarded in case of fire; that he is protected from accidents caused by neglect or indifference; that proper precautions are taken to prevent poisoning by the materials and processes of his industry, and that he works under conditions conducive to good health, and not such as breed disease.

Indifference to these matters reflects grossly upon the present day civilization, and it is regrettable that our State and national legislation on the subject of industrial hygiene compares so unfavorably with that of other countries.

Factory workers particularly need protection and supervision. Among them disease more easily finds its victims than among other classes of workers. Every epidemic has drawn most of its victims from the working classes. Statistics show the greater mortality of those engaged in factory work, as compared with those in other occupations.

The death rates of males per 1,000, according to occupations for registration states (12th Census, U. S., Vol. III, p. cclxi). are as follows:

Mercantile and Trading .....	12.1
Clerical and Official .....	13.5
Professional .....	15.3
Laboring and Servant ....	20.2

New York has already expended great sums of money to conserve its natural resources. The conservation of human life, the most valuable of all things, has received but little attention. The appointment of this Commission was the first comprehensive attempt to investigate the waste of human life in our modern industrial system, and to endeavor to devise means to prevent such a sacrifice, surely a matter of equal importance to the preservation of forests and streams.

Fires and industrial accidents are fortunately only occasional and extraordinary events. Their effects are visible and immediate so they are impressed forcibly upon our minds. But the common, everyday incidents of industrial life, the lack of ventilation, the long hours of labor amid insanitary surroundings, the failure to give notice to employees of the dangers of their occupations and how to avoid them, these work unnoticed, but the toll of human life they exact is very great.

The illness and diseases caused by these conditions can in large measure be prevented, and prevention is always better than cure and less costly. In his report on National Vitality, Professor Irving Fisher shows that the economic gain to the nation that would result from proper precaution to prevent sickness and disease, would amount to at least \$500,000,000 per annum.

A New York State manufacturer testified before the Commission that he had installed a great many sanitary improvements and labor-saving devices tending to the comfort of his employees. He expressly disclaimed any philanthropical motives in so doing, but said it was a decided benefit to him in his business from a purely dollars-and-cents standpoint.

During the past few decades methods of protecting machinery in use have been vastly improved. Labor-saving devices have been introduced everywhere, but much remains to be done by the manufacturer to conserve the most valuable of all assets — the working man and the working woman. It cannot be said that this waste is the result of intentional wrongdoing. It has simply been nobody's business, and therefore has been neglected and unheeded.

The investigation has already produced results. In many cases the manufacturers themselves were unaware of the conditions under which they required their employees to work, or if indeed they were aware of these conditions, did not realize their evil effects. Many did not know what could be done to improve them. They took these conditions as a matter of course.

The authorities in many cities, because of the publicity of the Commission's inquiry, began special investigations, which resulted in many cases in improved conditions. The educational value of the Commission, therefore, has been very great. The manufacturers who had not only complied with the provisions of the law, but had gone beyond its requirements, should feel rewarded by the contrast which was shown.

A general awakening has taken place throughout the State. A far larger number of inspections by authorities have been made than ever before. No great reliance, however, can be placed upon such a momentary or spasmodic awakening. When its cause is no longer present, conditions relapse into their former state, and there is little real improvement.

To improve the industrial situation permanently, clear, concise and comprehensive legislation is needed.

#### LIMITATIONS OF THE COMMISSION'S WORK.

At the outset it became clear that to carry out the mandate of the Legislature would require far more time than was at the disposal of the Commission.

It would have been impossible, even if the Commission had devoted every hour of time since the passage of the Act, to touch more than a portion of its work. Of the 248 industries in the State only 20 could be partially covered in its investigations.

Governor Dix in his last annual message to the Legislature, said:

“It is clear that it has been impossible for the Commission, in the short time at its disposal, to complete its labors, although its members have worked most diligently and

energetically, and I therefore suggest to the Legislature that the time of the Commission be extended at least one year, and that sufficient appropriation be made to meet its necessary expenditures.

It appears that conditions in manufacturing similar to those which have been shown in the cities of the first and second class exist in other cities and localities of the State, and that in the interest of the citizens the scope of the investigation should be broadened so as to cover the entire State, and all establishments where workingmen and workingwomen are employed."

There is always a temptation where conditions are disclosed which seem to need remedying to make recommendations for legislation, but the Commission has felt that hasty and ill-considered legislation is worse than none, and in many cases considers the remedy to be the proper and efficient enforcement of existing laws. The testimony given shows conclusively that the these laws are not adequately enforced. The authority responsible for conditions should be given sufficient power to compel a speedy compliance with its orders, and that power should be exercised promptly and effectively. In the enactment of new laws, proper means should be provided for their complete enforcement.

Mindful, however, of the obligation upon it to recommend remedial legislation, the Commission has made such recommendations wherever it has felt itself competent to do so.

The Commission considered it its duty to devote the larger part of its time to ascertaining all the facts with reference to the fire hazard problem so that it could make recommendations as comprehensive as was permissible on that subject for existing factory buildings. With reference to buildings to be hereafter erected, the Commission limits itself to a few general recommendations.

If its continuance in office is extended, the Commission hopes, among other things, to prepare and submit to the Legislature a Building Code for industrial establishments within the State of New York. The necessity for such a Building Code has been recognized by all who have considered the subject. There should be no great discrimination between the requirements for manu-

facturing establishments in the different cities and towns. Certain basic rules as to construction can readily be made which should govern throughout the entire State.

The Commission devoted much of its time to an investigation of cellar bakeries, in view of the conditions disclosed in the City of New York. The Commission has therefore been able to make recommendations for the improvement of existing bakeries; and for the proper maintenance of those to be opened in the future.

As to sanitation in factories, the Commission recognizes that it has only begun its labors, and therefore makes only a few recommendations under this heading. Likewise the Commission has made only a very general investigation of the adequacy of the present system of factory inspection. Because of lack of time, it has been able to give the Commissioner of Labor only a brief hearing, but it has examined a number of the inspectors employed in the department.

The Commission has likewise been able to make but a brief investigation into the subjects of child labor, manufacturing in tenement houses, and the employment of women. Far more time is needed for a thorough study of these subjects, and practically all of the witnesses who testified before the Commission recommended its continuance for that purpose.

#### SUMMARY OF WORK DONE BY THE COMMISSION.

##### 1. PUBLIC HEARINGS.

Owing to the fact that the sessions of the Legislature continued until the month of October, 1911, and that most of the Commissioners were members of the Legislature, it was not until October 14, 1911, that the first public hearing of the Commission could be held.

There were fourteen public hearing in the city of New York and eight public hearings in the cities of Buffalo, Rochester, Syracuse, Utica, Schenectady and Troy. The sessions in these cities began at 9:30 in the morning and lasted until late at night. 222 witnesses testified, and 3,489 pages of testimony were taken.



The Commission endeavored to have before it as witnesses persons from all walks of life, including city and State officials, experts upon the different problems under consideration, manufacturers and working-men, women and children, able to testify concerning the conditions in the factories and manufacturing establishments of the State; officers of labor organizations and members of other associations, interested in the matters under investigation.

A transcript of the testimony taken is submitted with this report.

## 2. EXECUTIVE SESSIONS OF COMMISSION.

The Commission as a whole held fifteen executive sessions, and its sub-committees appointed to consider various matters also held several meetings. The Commission in executive session discussed with Prof. John R. Commons, a member of the Wisconsin Industrial Commission, the formation, scope, and operation of the Wisconsin Commission, and to what extent the system of factory inspection and supervision now obtaining in that State could be applied here. Prof. Commons came to New York at the Commission's request, and the Commission desires to express its gratitude to him for his courtesy.

## 3. INSPECTIONS AND SPECIAL INVESTIGATIONS MADE BY THE COMMISSION.

### a. GENERAL SANITARY INVESTIGATIONS.

One thousand eight hundred and thirty-six industrial establishments in the various cities of the State were inspected by a staff of from eight to ten inspectors engaged in field work for a period of five weeks. Twenty industries were covered.

Of the total number of factories, 1,636 were located in the City of New York and employed in all 41,891 men, women and children. One hundred and nine manufacturing establishments were investigated in the cities of Buffalo, Rochester, Syracuse, Utica, Schenectady and Troy, employing 12,977 persons. The following industries were among those investigated: printing, tobacco,

chemicals, bread, candy, ice cream, pickles, spices and drugs, sugar refineries, mineral waters, meat packing, artificial flowers, paper boxes, clothing, corks, rags, textiles, human hair, cleaning and dyeing. The investigations were made with reference to the general sanitary conditions in these manufacturing establishments; covering cleanliness, sanitary conveniences, ventilation, light, etc.

The preliminary report of Dr. Price, setting forth in detail the work which was done under his supervision, and the results and statistics obtained, is annexed to and forms a part of this report, and is marked Appendix 1.

#### *b.* FIRE HAZARD INVESTIGATIONS.

A general inspection of factories and manufacturing establishments was made to ascertain existing conditions with reference to the fire hazard and the remedies to be suggested to improve the same.

Several hundred inspections were made under the supervision of Mr. Porter, with the assistance of a corps of inspectors, in the cities of the first and second class. Mr. Porter's report is annexed to and forms a part of this report, and is marked Appendix 2.

#### *c.* BAKERY INVESTIGATIONS.

An investigation of 500 bakeries in the City of New York and elsewhere was made under the supervision of Dr. Price. A special feature of the investigation was the physical examination made by a medical staff in the employ of the Commission of 800 bakers in the bake-shops during working hours. This examination occupied four weeks, and was made with the assistance of officials of the Bakers' Union of New York City.

A special report on the sanitary conditions in bakeries and the physical condition of those employed therein was submitted to the Commission by Dr. Price, is annexed hereto and forms a part of this report, and is marked Appendix 3.

*d.* WOMEN'S TRADES INVESTIGATIONS.

It was found that in six of the trades inspected under Dr. Price's supervision over sixty per cent. of those employed were women and girls. A report entitled "Notes on trades employing a large proportion of women workers in New York State" is annexed to and forms a part of this report, and is marked Appendix 4.

*e.* VOLUNTEER INVESTIGATIONS.

(1) ON SANITARY CONDITIONS IN FACTORIES AND MANUFACTURING ESTABLISHMENTS IN A SELECTED AREA IN NEW YORK.— This report was prepared by Miss Pauline Goldmark, Associate Director of the School of Philanthropy of the City of New York. Investigations were conducted in the district between 34th and 53rd street, extending from 8th avenue to the Hudson River, in the Borough of Manhattan, New York city. Three hundred and twenty-three factories were investigated, giving employment to 10,750 men, women and children. Fifteen separate industries were carefully investigated. Miss Goldmark's report entitled "Notes on an Industrial Survey in a Selected Area in New York City with respect to Sanitary Conditions in Factories" is annexed to and made a part of this report, and marked Appendix 5.

(2) LEAD POISONING.— A preliminary investigation of lead and arsenical poisoning was conducted by Dr. E. E. Pratt, Associate Professor of Economics in the School of Philanthropy, with the assistance of fellows and students of the school; 275 cases of lead poisoning were traced. Dr. Pratt's report, illustrating the different processes which may result in lead poisoning and detailing the histories of 78 cases, is annexed to and forms a part of this report, and is marked Appendix 6.

(3) PRELIMINARY REPORT ON CHILD LABOR IN THE TENEMENTS.

Under the auspices of the Commission, Mr. Owen R. Lovejoy and Miss Elizabeth C. Watson, of the National Child Labor Committee, conducted an investigation into the employment of children

in home work in tenement houses in New York city. The report and photographs made, showing actual conditions under which children are employed in tenement houses, are annexed to and form a part of this report, and are marked Appendix 7.

The Commission takes this opportunity to express its gratitude for the care and thoroughness with which these volunteer investigations were conducted. The results of the investigations are most valuable contributions to the work of the Commission.

#### 4. QUESTIONNAIRE ISSUED BY THE COMMISSION.

The Commission issued a Questionnaire asking for suggestions for the improvement of the conditions under which manufacturing is carried on. A copy of the Questionnaire, together with a digest of the many replies received, is annexed to and forms a part of this report, and is marked Appendix 8.

5. BRIEFS AND MEMORANDA SUBMITTED TO THE COMMISSION.—The thanks of the Commission are due to public-spirited citizens and organizations who submitted important briefs and memoranda on the subjects under consideration. Copies of these briefs and memoranda are annexed to and form a part of this report, and are marked Appendix 9.

## **GENERAL OUTLINE OF THE REPORT**

1. The Fire Hazard.
2. Factory Inspection.
3. Sanitation of Factories and Manufacturing Establishments.
4. Occupational Diseases.
5. Bakeries.
6. Manufacturing in Tenements.
7. Employment of Women.
8. Child Labor.
9. Foundries.

## THE FIRE HAZARD IN FACTORY BUILDINGS

It has long been known that there are many more fires in the cities of the United States than in the cities of the same size in Europe. There the fires are not only less frequent, but are also far less destructive. In this country fires occur almost hourly in which large amounts of property are destroyed and lives are lost.

Testimony presented to the Commission shows that in the city of New York alone, there is an average loss of one life a day, by fire. Our public machinery for extinguishing fires, especially in the larger cities, is remarkably efficient, yet this loss of life and property continues to grow.

According to Geological Survey Bulletin No. 418:

“The actual fire losses due to the destruction of buildings and their contents amounted (in 1907, the latest year for which statistics are available) to \$215,084,709, a *per capita* loss for the United States of \$2.51. The *per capita* losses in the cities of the six leading European countries amounted to but 33 cents, or about one-eighth of the *per capita* loss sustained in the United States.”

The Hon. Walter L. Fisher, Secretary of the Interior, in an address before the Fifteenth Annual Meeting of the National Fire Protection Association, states the situation admirably:

“If the Government should suddenly lay an annual tax of \$2.51 on every man, woman and child in the United States on a promise of spending the money for some useful purpose, that promise would not avail against the storm of protest which would be aroused. Nevertheless, a tax which in the aggregate amounts to that is being paid by the people of this country. It is the annual fire loss of the nation upon buildings and their contents alone. It is expended not in productive enterprise, but in death and destruction, and an even larger sum is annually expended upon fire protection and insurance premiums. Not only is this property loss paid by our people, but, in addition, annually 1,500 persons give up their lives, and nearly 6,000 are injured in fires.

Possibly in no other direction is the national habit of waste more clearly exemplified than in the comparative indifference with which we permit such a sacrifice. In no other civilized country are conditions so bad as they are here.

It seems ridiculous that a people so apt and so eager to seek out and destroy the mysterious and hidden enemies of mankind should be so slow and sluggish in fighting a foe so plainly in sight and so readily vanquished. We have led the world in seeking out the causes of pestilence and removing them. We are in the very vanguard of the battle against tuberculosis, typhoid and yellow fever, and still we stand apart and let the older nations lead the fight against an enemy much more easily conquered."

The consideration of the fire hazard problem is divided into two parts:

1st. Investigation of conditions in existing factory buildings, and recommendations to render those premises safe.

2nd. Requirements for future construction of factory buildings which will reduce the fire hazard.

Factory buildings may be classified as *special factories* or buildings especially constructed for manufacturing purposes, generally occupied by one or two establishments, *loft buildings*, which may be fireproof or non-fireproof, and *dwellings* or *tenements* originally erected for living purposes, but which have been converted into factories.

#### I.—THE EXISTING FIRE PROBLEM IN NEW YORK CITY.

Five kinds of buildings are used for factory purposes in the City of New York.

I. The converted tenement or dwelling.

II. The non-fireproof loft building.

III. The fireproof loft building less than 150 feet in height.

IV. The fireproof loft building over 150 feet in height.

V. The factory building proper, constructed for factory purposes and occupied by one establishment, which may be fireproof or non-fireproof.

Three of the above types are especially dangerous when used as factory buildings. These are (1st) the converted dwelling or tenement house which was never intended to be used for business purposes above the ground floor; (2nd) the non-fireproof loft building, usually six or seven stories high; and (3rd) the fireproof loft building less than 150 feet in height.

### 1. THE CONVERTED DWELLING OR TENEMENT.

Owing to the increase in land values and change in the residence localities, a number of buildings formerly used for living purposes have been made over into factories. The buildings are from four to six stories in height, usually 25 feet wide by about 60 to 85 feet deep. The exterior walls are brick or stone, the floors, interior trim, stairways, beams and doors are of wood. The stairways are usually from two to three feet in width, the doors often open inward; there are no automatic sprinkler systems, no fire prevention or extinguishing appliances except fire pails, which are not always preserved for fire purposes; the workrooms are divided by wooden partitions and crowded with employees, while the machines are placed as close together as space will permit, without regard to means of exit. There are exterior fire-escapes with balconies on each floor, connected by vertical ladders (those of later construction by inclined stairways), which usually lead to a yard in the rear of the premises, or to some blind alley from which there is no means of escape. There is ordinarily a ladder from the lowest balcony to the ground, but it is generally not in place, or very difficult to use in case of fire because of its weight. There is usually but one door leading from the street.

Here we have a type of building constructed for dwelling purposes only, in which the number of occupants is multiplied any number of times without any change in the exit facilities provided.

### 2. THE LOFT BUILDING.

The loft building marks an evolution in the construction of factory buildings in the City of New York. The first lofts were built



about twenty-five years ago, for the storing and sale of merchandise, but the manufacturer soon found it desirable to have his goods manufactured in workrooms adjacent to his salesroom and directly under his supervision.

Increase in land values, moreover, forced the manufacturer to extend upwards instead of spreading out horizontally. The availability of the loft for manufacturing purposes was soon appreciated, and to-day this type of building is generally used for factory purposes.

(a) *The Non-Fireproof Loft Building.*

The non-fireproof loft building is usually six or seven stories in height, 25 feet wide by 80 feet in depth, with brick, stone or iron fronts and rears, brick side walls, wooden floors and wooden trim. There is usually one unenclosed wooden stairway, varying in width from two to three and one-half feet, and often winding around the elevator shaft. Wooden doors lead to the stairways; very often the doors open inwardly. These buildings, as a rule, possess exterior fire-escapes similar to those found on the converted tenement described above. Usually every floor in these buildings is occupied by a different tenant, in some cases there being two or more tenants on each floor. The tenant uses the floor, or his portion of it, as salesroom, office and factory, dividing one from the other by wooden partitions. In the manufacturing part there are usually a number of machines placed as close together as possible with little aisle space between. These buildings are to be found in numbers on the lower east and west side. The number of people permitted to work on a floor is restricted only by a provision of the Labor Law which provides a minimum of 250 cubic feet of air space per person and entirely disregards the floor area. As the distance between floor and ceiling is at least ten feet, and often more, this cubic air space is easily obtained without any appreciable prevention of overcrowding and congestion. The present law does not require the posting of the number of people allowed even by this standard, and so prosecutions for violations of this law are practically unknown. These buildings usually do not contain any automatic sprinklers. They have fire pails, which are rarely kept for the proper purpose. A few of them have stand-pipes, with hose which is often useless.

*(b) The Fireproof Loft Building Less than 150 Feet High.*

The fireproof loft building less than 150 feet in height, that is, about 12 stories or under, has brick, stone or metal exterior walls, wooden floors and trim, stairways of metal or stone and elevators. Stairways are generally about three feet wide, enclosed by fireproof walls. These buildings are either 25, 50, 75 or 100 feet wide by 85 to 200 feet in depth, the usual size being 50 by 80 or 90 feet. The conditions of occupancy as to tenants are similar to those in the non-fireproof loft buildings just described. The Triangle Waist Company occupied a building of this type at 23-29 Washington place. That building, in its construction and interior, is typical of the so-called fireproof loft buildings, and indeed much better than hundreds of buildings used for similar purposes in New York city to-day. Some of these buildings have automatic sprinkler systems. They are usually provided with stand pipes, connected with the city water supply, and have on each floor a hose of required length, and some are provided with exterior fire-escapes. It is to be noted that in these buildings the elevators are used to go from the street to the upper floors not only by the employers but by the employees. In most cases the latter are absolutely unaware of the location of the stairways. Auxiliary fire appliances are present in most cases, but their existence is unknown to the workers and no care is given to their preservation. The interior arrangements are similar to those existing in the non-fireproof loft building, the same wooden partitions, the same congestion and doors opening inwardly.

Testimony shows that the danger in these so-called fireproof buildings results from the use of wood for floors, doors and trim. The buildings are usually of such a height that the Fire Department ladders and extensions, and even the water towers, do not reach the upper stories. Fire occurring in these places under conditions of manufacture which are hereafter described usually results in the destruction of the entire contents of the building, while walls and floors remain substantially intact.

*(c) The Fireproof Loft Building More than 150 Feet in Height.*

This building is more than twelve stories in height. The walls are of brick, stone or metal, the floors are of cement or stone, the

trim and doors are of metal or fire-resisting material, the stairways are of stone or metal, and enclosed by fireproof walls. There are usually several stairways and elevators. The buildings are sometimes supplied with automatic sprinkler systems and have stand-pipes to which hose is connected on each floor, and other appliances for extinguishing fires. In addition, these buildings sometimes have exterior stairways leading either to the street or to the ground in the rear. The buildings are usually 50, 75 or 100 feet or more in width and are from 75 to 200 feet deep. They are occupied for manufacturing and other purposes, and sometimes one tenant is found to occupy more than one floor. In these buildings, if a fire occurs, it is usually confined to the floor on which it starts, since it cannot burn up or down except through the windows.

Above the sixth floor these buildings are open to the same objections as are fireproof buildings less than 150 feet high, namely the upper floors cannot be reached by the firemen. The exit facilities are usually well constructed, but the number of people who occupy these buildings is not determined by either exits, width of stairways, or floor space. The only restriction is, as in all other buildings, the 250 cubic feet of air space provision. The distance between the floors is usually 10 to 15 feet, so the cubic air space may fulfil the legal requirement while the floor presents a congested condition.

#### DANGER TO LIFE IN FIREPROOF BUILDINGS

Particular reference is made to the fireproof building which is believed on account of its construction to be safer for the occupants than the non-fireproof building and to require few if any precautions, either to prevent fire or to preserve the safety of the occupants in case of fire. The testimony discloses the weakness of these suppositions. While the fireproof building itself will not burn, the merchandise, wooden partitions and other inflammable material burn as readily in a fireproof building as in any other. It is assumed by all fire insurance experts that when a fire occurs on any one floor, the contents of that entire floor will be destroyed. It is like placing paper in a fireproof box — it confines the fire to that locality, but the fire is just as hot and just as

destructive within its bounds. Therefore, unless means are provided for automatically extinguishing fires and for the rapid escape of the occupants, loss of life may occur even in fireproof buildings.

The Triangle Waist Company fire is illustrative of this fact. There the building was practically left intact, yet the fire was severe enough to cause the death of a large number of the occupants. In a fireproof building the fire is confined to a limited area and is therefore more easily controlled. The occupants of floors over eighty feet from the ground cannot, however, be reached by the Fire Department's ladders, and must trust for escape to the stairways or exterior fire-escapes.

In many of these buildings the occupants manufacture garments and other inflammable articles. The floors are littered with a quantity of cuttings, waste material and rubbish, and are often soaked with oil or grease. No regular effort is made to clear the floors. No fireproof receptacles are provided for the accumulated waste, which in some cases is not removed from the floors for many days. Many of the workmen, foremen and employers smoke during business hours and at meal times. Lighted gas jets are unprotected by globes or wire netting, and are placed near to the inflammable material. Very often quantities of made-up garments and inflammable raw material are stored in those lofts. Fire drills are not held, save in rare instances, exits are unmarked, and the location of the stairways and exterior fire-escapes is often unknown. Access to the stairway and outside fire-escapes is obstructed by machinery, wooden partitions and piled-up merchandise, while in some cases the fire-escape balcony is at such a distance from the floor as to make it almost impossible for women employees to reach it without assistance. Wired glass is not used in the windows facing the balconies of the fire-escapes except in fireproof buildings over 150 feet high. In some cases the windows leading to fire-escapes are not large enough to permit the passage of grown persons readily. Automatic or manual fire-alarms are hardly ever provided, except in the larger fireproof buildings.

## II.—THE EXISTING FIRE PROBLEM IN OTHER CITIES OF THE STATE.

In the cities of Buffalo, Rochester and Syracuse, there are some loft buildings in which manufacturing is carried on, but comparatively few are of great height, so that this problem is not nearly so complicated or extensive there as in New York city. In these cities manufacturing is usually conducted in special factory buildings which vary from three to six stories in height. Such buildings, save those recently constructed, are almost always non-fireproof. The walls are of brick, stone or metal, the floors, trim, doors and stairways are wooden, the latter are in an open well or surrounded by wooden partitions. Sometimes there are exterior fire-escapes. These buildings do not have, as a rule, any automatic sprinklers, or appliances for extinguishing fire, except fire pails, which are frequently in a useless condition.

A feature of some of these buildings is the "gas pipe" fire-escape. These fire-escapes consist of vertical iron or metal ladders affixed to the wall of the building, adjacent to the windows. The rungs of these ladders are circular—probably one inch in diameter, and placed at a distance of a few inches from the wall. They usually run from the top floor of the buildings to the first floor, with no means of reaching the ground. Only an acrobat could safely descend them. The Chief of the Fire Department of one of these cities testified that he could not use these ladders, but that if it came to a question of being burned alive or using the fire-escape, he supposed he would try it. These so-called fire-escapes are a delusion and a snare and are useless in an emergency.

The lack of precautions to prevent fire exists all through the State as well as in New York city. Smoking goes on in just the same way, rubbish is piled upon fire-escapes, over-crowding and congestion prevail, and no attempt is made to keep a clear and unobstructed passageway to exits. Access to exterior fire-escapes in many cases is impossible because of obstructions in front of doors and windows. Wooden partitions exist in most of the buildings, doors open inward, inflammable material used in manufacturing is kept on hand in quantities, gas jets are unprotected, and there is no means provided in the building of giving an alarm of fire either to the occupants or to Fire Headquarters. Little attempt is made at regular cleaning-up. Fire drills are practically unknown.

## III.— ENFORCEMENT OF LAWS RELATIVE TO FIRE.

1. IN NEW YORK CITY.— Up to the date of the appointment of the Commission and for some months thereafter, responsibility for the safety of the occupants of factory buildings in case of fire was divided among six city Departments and the State Department of Labor.

The Department of Buildings had jurisdiction over the construction of factory buildings and the fire-escape facilities in them. The Building Department, after the factory was constructed, however, inspected only after specific complaint.

The Fire Department had jurisdiction over the fire extinguishing apparatus in the building.

The Police Department had jurisdiction over obstructions on the fire-escapes.

The Department of Water Supply had jurisdiction over the proper installation of electric wiring and apparatus.

The Tenement House Department had jurisdiction over exits and fire-escape facilities in all tenement houses, including those in which manufacturing is carried on.

The Board of Health had summary jurisdiction over any condition that constituted a menace to public health and safety. The Board of Health, however, acts only on specific information and complaint and in most instances refers such complaints to the Building or Labor Departments.

The State Department of Labor had jurisdiction after the building was erected, as to doors opening outward, and over the enforcement of the provision requiring 250 cubic feet of air space per person, and the maintaining of free access to fire-escapes and unobstructed exits. If a man had an obstruction on the fire-escape, the Police Department alone could compel him to remove it. He could then move it into the passageway leading to the fire-escape and then it would come under the jurisdiction of the Labor Department. It was possible in one factory to have a condition of affairs which called for the intervention of all six Departments in one day, and for which no one Department was responsible. Such a condition, of course, was intolerable. The Sullivan-Hoeys Fire Prevention Law, enacted shortly after the appointment of this Commission, attempts to change this state of affairs for New York city.

The purpose of that law is to center the responsibility for the enforcement of all laws and ordinances relating to the safety of the occupants of factory buildings in case of fire in one Department,—the Fire Department of the city which would have full jurisdiction and full responsibility. In addition, the Fire Commissioner was given the power to require any building to be vacated in which conditions were such as, in his opinion, would imperil the lives of the occupants. The law has been in operation but a short time, and its success cannot at this time be determined. Undoubtedly, the principle upon which it is based is a sound one.

Several defects in the law have been called to the attention of the Commission, but before the operation of the law has been tested the Commission does not desire to suggest any changes.

2. IN OTHER CITIES OF THE STATE.—To an extent, the same confusion and duplication of responsibility existed in other cities of the State. Each of the cities has a local Fire Department which has more or less jurisdiction over the erection of fire-escapes on buildings. Some cities have a Fire Marshal who passes upon the plans for projected buildings, the title in other cities being changed to that of Superintendent of Buildings. There is in some of the cities a health officer who has power to deal with a number of the conditions arising in manufacturing establishments.

The State Department of Labor, under the Labor Law, has complete jurisdiction over fire-escape facilities, and over matters relating to the safety of occupants of the factory buildings in case of fire. Its jurisdiction in this regard is not limited as it is in the city of New York. However, a confusion as to the respective duties of the different city officials and the State Department of Labor was found to exist on all sides. Except in a few notable instances, it was found that but little reliance could be placed on inspection and supervision of the local city officials. It was their contention that the responsibility for proper fire-escape facilities rested with the State Department of Labor.

Since the appointment of this Commission, an act has been passed by the Legislature creating a State Fire Marshal, with the power to enforce all laws and regulations of the State and the

cities thereof (except New York city) relating to the construction, maintenance and regulation of fire-escapes, the means and adequacy of exit, and the installation and maintenance of alarm systems and fire extinguishing equipment. Under this act, Fire Marshals in the various cities were made deputies of the State Fire Marshal. The State Fire Marshal has been in office but a short time, and the results of his administration cannot at this time be foreseen. The act results, however, in bringing about a co-operation between State and city officials which is of the utmost importance.

## RECOMMENDATIONS OF THE COMMISSION.

### PREVENTION OF FIRE.

Testimony was given that at least 50 per cent of the fires occurring to-day could be prevented by taking certain simple and inexpensive precautions. Some experts placed the percentage of preventable fires as high as 75 per cent. Fire extinguishment has received careful attention in the past, and to-day the means supplied for extinguishing fires are many. But little attention, until recently, has been given to the subject of fire prevention. An ounce of prevention in the case of fires, as in any other case, is worth a pound of cure.

The principal causes of fires in the city of New York during the past few years have been rubbish heaps, lighted matches, cigars and cigarettes, and exposed gas jets. It is believed by the Commission that the prohibition of smoking in manufacturing establishments, and the cleaning up or removal of rubbish, cuttings and waste from the floors, and providing fireproof receptacles therefor, will be most effective in the prevention of fires.

The fire in the Triangle Waist Company building was caused by a lighted cigarette thrown upon a pile of cuttings. Smoking should be strictly prohibited to both employees and employers. The Commission in its investigation visited among other establishments, a cigar factory in a converted tenement house where there were several hundred employees at work. The foreman was asked whether smoking was allowed. He stated that smoking was prohibited — although at that moment he was busily engaged in smoking his own cigar. A number of witnesses testified



that while smoking ought to be prohibited, its prevention was a hopeless task. Such an attitude surprises the Commission, as it believes from its investigation that a little education upon the subject will convince both employee and employer of the wisdom and necessity of this law. Smoking in a factory is a constant menace to all employed therein.

Chiefs of the Fire Departments in nearly every city testified that fires in factory buildings would be reduced by 50% if provisions for the removal of rubbish, the protection of gas jets and the prohibition of smoking were enacted and were promptly and fully complied with. The requirement of these provisions will work no hardship upon anyone, and will entail no great expense. Their proper enforcement depends, however, upon adequate and systematic inspection and prompt and effective punishment for violation. Sufficient means should be given the department charged with the enforcement of this law for the strict punishment of those who fail to comply with its provisions, so that there may be no excuse for non-compliance.

The Commission therefore recommends on the subject of prevention of fires the following:

*Fireproof receptacles.* There shall be provided in every factory building or manufacturing establishment a sufficient number of properly covered fireproof receptacles, to be placed as may be directed by the Fire Commissioner of the City of New York, and elsewhere by the Commissioner of Labor, in which shall be placed all inflammable waste materials, cuttings and rubbish. Waste materials, rubbish and cuttings shall not be permitted to accumulate on the floors of any factory or manufacturing establishment, and the same shall be removed therefrom not less than twice during each day. All rubbish, cuttings and waste materials shall be entirely removed from a factory building at least once in each day.

*Gas Jets.* All gas jets or lights in factories or manufacturing establishments shall be properly enclosed by globes, or wire cages, or shall be otherwise properly protected.

*Smoking.* Smoking in all factories or manufacturing establishments shall be prohibited.

A notice to that effect setting forth the penalty for violation thereof shall be posted on every floor of such establishment in English and such other language or languages as the local Fire Commissioner or Fire Marshal shall direct.

#### NOTICE TO AUTHORITIES IN CASE OF FIRE.

No matter what care and what precautions may be taken, fires will occur, and attempts are frequently made by employees to extinguish them before calling upon the public authorities. In almost every case this is a serious mistake. In the Triangle Waist Company and Equitable Building fires, lives would have been saved and the fire would not have been nearly so severe, if the Fire Department had been promptly notified. In this regard the Commission can do no more than lay before the public the facts disclosed. It had been the intention of the Commission, after examining into the matter, to recommend the installation of automatic or manual fire alarms in certain factories. After conferring, however, with the Fire Commissioner and the Chief of the Fire Department in New York City, the Commission has decided to withhold for the present, this recommendation, for the following reasons:

1st. The present fire-alarm telegraph system at Fire Headquarters is entirely inadequate to deal with the large number of alarm stations that would be created as a result of this provision.

2nd. The business of installing automatic or manual fire alarms in the City of New York is in the hands of but three or four concerns, and there is danger, if any such mandatory legislation were enacted, that it might cause serious inconvenience to those affected thereby.

3rd. The Fire Department at present has no control over the systems of automatic fire alarms, and their efficiency does not always prove equal to the test.

The Commission emphatically states, however, its belief in notification of Fire Headquarters by some automatic or manual means

on the premises, in case of fire in a factory building where more than 250 persons are employed. The Commission expects to take up this matter again during its continuance, and believes by that time there will be such changes in conditions that it will be able to make some recommendations upon this subject.

#### NOTICE TO OCCUPANTS IN CASE OF FIRE.

The Commission gave much thought and attention to means of notifying the occupants of a building in case of fire. After consideration of the facts before it, the Commission is of the opinion that the dangers from panic and excitement caused by any alarm, such as the ringing of a bell indicating on which floor the fire had occurred, when the alarm might be false or the fire slight and readily controlled, outweighed the advantage to be gained. Therefore the Commission does not at this time recommend any automatic fire-alarm system, save as may become necessary in connection with the operation of a fire drill hereinafter provided for.

#### FIRE DRILLS.

The Commission personally witnessed fire drills in factory buildings, and some testimony was taken upon this subject. The Commission believes that in factory buildings where more than twenty-five persons are regularly employed above the second story, a fire drill should be conducted. One of the purposes of the fire drill should be to indicate to the occupants where the stairways are, and the means of reaching them. It has been found in many of the larger buildings where the occupants use the elevators to go to and from their work, that the location of the stairs or exterior fire-escapes is unknown. A fire drill at any drill should be to indicate to the occupants, where the stairvision, and the Commission is therefore of the opinion that the drill should be supervised by the local Fire Departments. A fire drill is also extremely useful in preventing panic. While of course not so effective in the case of occupants of a loft or factory building as in the case of school children, it undoubtedly would go far in preventing a mad rush towards the exits. If the fire drill

accomplishes nothing more than to acquaint the occupants of a building with the different exits, to compel them to use those exits at stated intervals, and to keep them clear and unobstructed, it will have served its purpose. The periodical fire drill will constantly bring to the minds of employee and employer alike the possibility of fire and the necessity for using every proper means to prevent the same. The Commission makes the following recommendation:

*Fire Drills.*—In every factory building or manufacturing establishment in which more than 25 persons are regularly employed above the ground or first floor, a fire drill of the occupants of such building shall be conducted at least once in every three months under the supervision of the local Fire Department or one of its officers. Every employer and employee shall aid and assist such Fire Department and its officials in conducting such fire drill. In the City of New York the Fire Commissioner, and elsewhere the State Fire Marshal, is authorized and directed to prepare appropriate rules and regulations to make effective this provision; said rules and regulations to be posted on each floor of every such factory building or establishment.

#### PREVENTION OF SPREAD OF FIRE.

Reference has already been made to the size of windows leading to balconies connected with exterior fire-escapes. In some cases these windows are too small in size to admit the free passage of a grown person. The windows are usually of ordinary glass, which does not resist fire at all. The flames break through these windows, and the result is that no protection whatever is afforded to those going down the fire-escapes. The use of wired glass instead of ordinary glass would serve as some means to check the flames and would give the employees on the upper stories who are compelled to resort to the exterior fire-escapes a much wider margin of safety.

Fire Departments are unable to reach with their ladders any point above the seventh story of a building or more than ninety feet above the ground. Therefore ordinary precautions are insufficient to safeguard properly the workers above the seventh floor. Much testimony was taken upon the use and efficacy

of automatic sprinkler systems. The Chiefs of various Fire Departments testified that one of the greatest means of preserving life, especially in high buildings and in those where wooden trim is used, is an automatic sprinkler system. This system, briefly, consists of a tank, usually upon the roof of the building, containing a large supply of water, communicating with pipes which run along the ceilings on the various floors. At regular intervals in these pipes are placed what is known as "sprinkler heads," fastened with fusible nuts which automatically break and discharge a flow of water when exposed to a certain degree of heat. The automatic sprinkler confines the fire to a limited area and checks it in its incipency.

Testimony as to the efficacy of sprinkler systems varies, but the lowest estimate of their proper working is 75 per cent and the highest 95 per cent. Proof was given that in the New England mills where sprinkler systems have been in use for many years, there was only one loss of life where a sprinkler system was installed, and in that case the water supply for the system was cut off just before the fire occurred. The installation of an automatic sprinkler eventually pays for itself in the form of a reduction of fire insurance premiums granted where the system is installed.

Such reduction of premiums is allowed, however, only if the system is one approved by the National Board of Fire Underwriters, consisting of representatives of all the fire insurance companies in the United States. This Board has approved of only a few systems, and the manufacturer who desires to obtain the benefit of a reduction of insurance must install one of these approved systems. Testimony was given indicating that there was some arrangement or understanding by which high prices were charged for these sprinkler systems.

It was also testified that any competent plumber could install a sprinkler system which would be effective in case of fire.

The installation of the automatic sprinkler system has been recommended by Fire Chiefs throughout the State, and by nearly all of the experts on the fire problem. The Commission does not desire to make any drastic recommendation on this subject, but it is convinced that in buildings over seven stories or 90 feet in height, in which wooden floors or wooden trim are used, and more

than 200 people are employed above the seventh floor, the only safe means to prevent the spread of fire and the loss of life incidental thereto would be the installation of an automatic sprinkler system.

Chief Kenlon of the New York Fire Department testified that had an automatic sprinkler system been installed in the Triangle Waist Company building, he believed that not a single life would have been lost. If manufacturing is carried on above the seventh story of a building, or 90 feet above the ground, the manufacturer should be required to furnish every possible device to safeguard the lives of his employees in case of fire.

The Commission therefore makes the following recommendations:

*Windows of Wired Glass.*—All windows and doors leading to outside fire-escapes shall be not less than two feet in width by five feet in height, and shall be constructed of wired glass.

*Automatic Sprinklers.*—In all factory buildings over seven stories or 90 feet in height in which wooden floors or wooden trim are used, and more than 200 people are regularly employed above the seventh floor, the owner of the building shall install an automatic sprinkler system in the form and manner approved by the Bureau of Fire Prevention in the City of New York and in all other parts of the State by the State Fire Marshal. Such installation shall be made within one year of the passage of the law carrying this recommendation into effect, the Fire Commissioner of the City of New York, and the State Fire Marshal elsewhere, to have the discretion to extend such time for good cause shown, for an additional year.

#### ESCAPE FROM WORKROOMS.

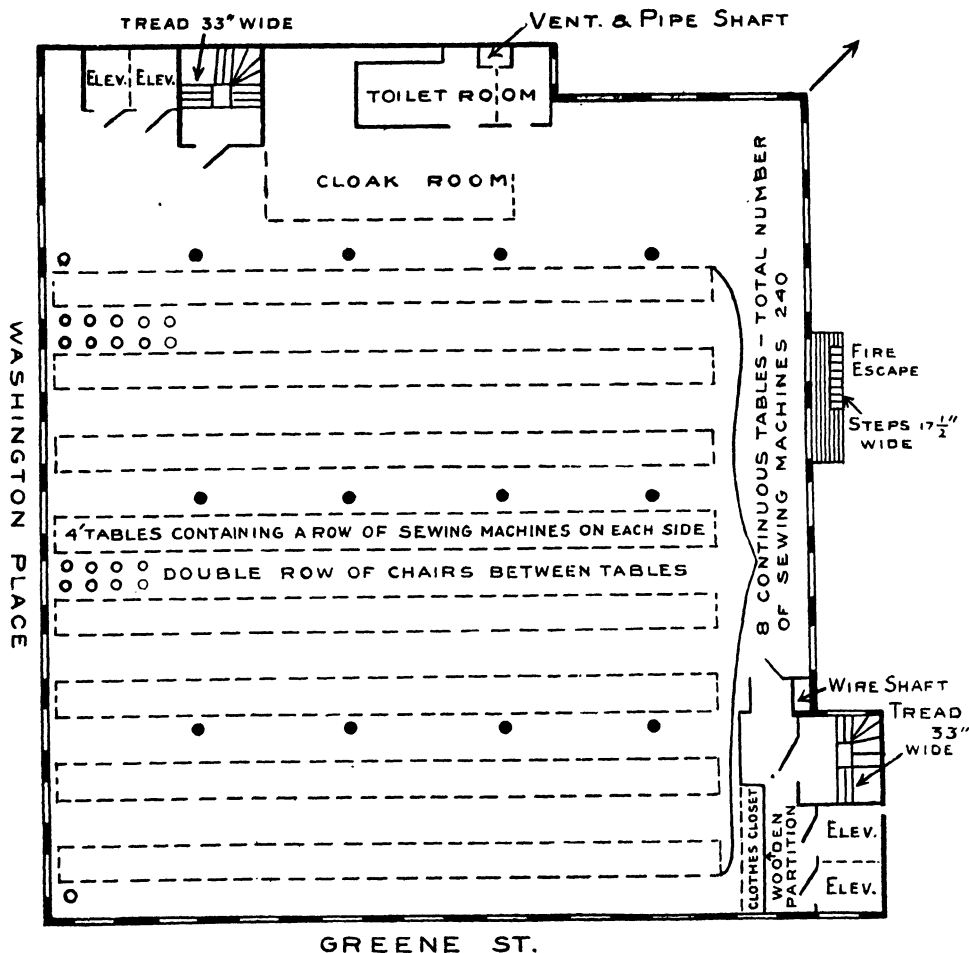
The Commission ascertained by investigation and testimony, that exits to outside fire-escapes and to interior stairways, especially when they lead through other portions of the loft, were often unknown to many of the operatives. It certainly is necessary to indicate clearly the location of these exits.

A contributing cause to the loss of life in the Triangle Waist Company fire was the lack of clear passageways leading to the

fire-escapes and stairways. The employees were so crowded together, seated at tables containing machines, with chairs back to back, that when a great number of them attempted to leave at the same time there was panic and confusion. The following is a diagram showing the arrangement of the sewing machines, and the congestion prevailing on the ninth floor of this building, where most of the deaths occurred.

## NINTH FLOOR PLAN OF ASCH BUILDING

Showing Arrangement of Stairs, Elevators, Fire  
Escape and Sewing Machine Tables



Scale 1/16 inch—1 foot.



In the report made by the Superintendent of the New York Board of Fire Underwriters, it was stated that 20 dead bodies were found near the machines "apparently overcome before they could extricate themselves from the crowded aisles." The condition which prevailed in this building obtains in many similar buildings. The necessity for clear and unobstructed passageways to exits should be absolutely insisted upon, otherwise with the slightest panic, even without a fire, severe injuries, if not loss of life, would occur.

The Commission has already commented on the width of doors and windows leading to outside fire-escapes. It has also found that the doors leading to stairways are too narrow. This is especially so in the old converted tenements where these narrow doors are a source of danger in case of panic or fire. The first rush is always for the doors. The attempt upon the part of a number of persons to pass through at one time leads to a jam, and if the doors are dangerously narrow, many would lose their lives. When there are only a few persons employed upon a floor a narrow door is not a serious objection, but where a number of persons are employed, regard for their safety requires that such dangerous conditions be remedied.

#### DOORS TO OPEN OUTWARD.

The present Labor Law provides (sec. 80), that doors leading to exits should open outward wherever practicable. This elastic provision has been so construed that, until the Triangle Waist fire, there were probably very few orders made requiring changes in existing doors. The danger involved in a crowd pushing against a door that opens inward is a most grave one. The trouble has been that in the old buildings some of the doors, if they opened outward, would obstruct the passageway up and down the stairways, but the suggestion has been made to the Commission that where it is impracticable to have doors open outward, doors which slide freely, could be provided.

It appears in the testimony that in many cases access to the fire-escapes was obstructed. Partitions were erected in some cases, piles of merchandise, machinery and other articles placed before them in others. There can be no question that access from the floor to the outside fire-escapes should be kept free and clear. This applies with even greater force to obstructions upon the balconies of the fire-escapes themselves. Sometimes these balconies are used as a convenient storage place for waste and refuse material, and for discarded and unused machinery.

In many of the older buildings, the distance from the floor to the window sills leading to the balcony of the exterior fire-escape is so high that, especially for women, it is difficult of access. The Commission recommends that where such distance from floor to sill is more than  $2\frac{1}{2}$  feet, there should be sufficient steps leading to the window sills to insure easy access to the fire-escape.

On this subject of escape from workrooms the Commission therefore makes the following recommendations:

*Exits from Workrooms.*— All exits leading from factory workrooms, including those leading to outside fire-escapes or interior stairways, shall be properly indicated by posting suitable signs at every exit. All doors and sashes of all windows leading to outside fire-escapes shall be painted with red paint.

*Passageways.*— All operatives in any factory shall be so placed or seated, and all machines, machinery, merchandise and other articles shall be so spaced or arranged as to afford to each and every employee a continuous, safe and unobstructed passageway to each and every exit.

The Commissioner of Labor shall have power to make and enforce rules and regulations to carry this provision into effect.

*Width of Exits.*— In every manufacturing establishment where more than 25 persons are employed on a floor, all doors and door ways upon such floor or floors leading to exits shall be at least three feet wide.

*Doors to Open Outward.*— In every manufacturing establishment where more than 20 people are employed

on one floor, all doors on such floor or floors leading to exits shall open outwardly, or shall be so constructed as to slide freely.

*Access to Fire-Escapes.*— Access to outside fire-escapes from the floor on which they are located and from the upper to the lower story, shall not be obstructed in any way.

*Access to Window-sills Leading to Fire-Escapes.*— There shall be free and easy access to all window-sills leading to outside fire-escapes. Where the distance from the floor to such window-sills is more than  $2\frac{1}{2}$  feet, a step or steps leading thereto, sufficient to provide free passage, shall be provided.

#### CHANGES IN EXISTING EXTERIOR FIRE-ESCAPES.

Investigation has shown that existing outside fire-escapes, in order to be of use, need some changes and additions. Testimony was given that outside fire-escapes were of very little value. In fact, the Chiefs of the Fire Departments testified that their best use was for the firemen to ascend with the hose. In case of fire, however, attempts are always made to utilize them, and as they have been erected at great expense and can be made useful with some slight changes, the Commission, after consideration, makes some recommendations with reference thereto.

Frequently there is no means of escape from the top balcony to the roof of the building. Therefore, the Commission believes that where there are exterior fire-escapes other than party wall fire-escapes, owners of buildings should be required to erect a goose-neck ladder or stairs to the roof. A similar provision is required in all tenement houses. The expense is trifling, and such a ladder may often prove to be of great value in case of fire.

Frequently no ladder is provided from the lowest balcony to the ground, and where a ladder is provided, it is of such weight and so placed that it is very difficult to use, especially in time of emergency. A balanced drop ladder should be provided from

the lowest balcony, of sufficient length to reach the ground. The drop ladders at present in use could be utilized for this purpose by affixing a balancing apparatus.

Where fire-escapes are erected on the rear of buildings, they often lead to narrow yards or alleyways from which there is no means of escape, and after a safe journey has been made to the landing place the person descending finds himself in a *cul de sac*.

Testimony showed that there are whole blocks of buildings in New York city in which these conditions prevail, and the occupants who in case of a fire should descend the fire-escapes to these yards, would find their escape entirely cut off.

The following recommendations with reference to existing outside fire-escapes are therefore made:

*Existing Outside Fire-Escapes.* On all existing outside fire-escapes, except party wall fire-escapes, there shall be provided the following:

(a) A goose neck ladder or stairs leading from the top floor balcony to and above the roof, and properly fastened thereto.

(b) A balanced drop ladder from the lowest balcony, of sufficient length to reach a safe landing place beneath.

(c) Safe and unobstructed exit from such landing place either by means of an opening in the fence leading to adjoining premises, or by means of a fireproof passageway leading to the street.

All of these are to be constructed in accordance with such regulations as may be adopted by the Fire Commissioner in the City of New York, and by the Commissioner of Labor elsewhere throughout the State.

#### LIMITATION OF NUMBER OF OCCUPANTS.

ACCORDING TO FLOOR SPACE.—A serious question before the Commission with reference to the problem of fire hazard was how

to limit properly the number of persons engaged in work on any one particular floor of a factory building.

The present law simply provides that 250 cubic feet of air space shall be allowed for each occupant. As the ceilings in most cases are high this does not prevent over-crowding. Posting of the number of occupants permitted is not required, and the law, even if enforced, is entirely inadequate.

The Commission gave careful consideration to this subject, and a sub-committee discussed all its phases at great length, and consulted many experts whose opinions were of value. It is the conclusion of the Commission that, irrespective of the number of exits, fireproof condition or means of extinguishing fire, the only safe method of preventing loss of life by panic or fire is to limit more adequately the number of persons on each floor. It was finally determined that the most effective method was to prescribe a minimum amount of floor space for each employee, making a difference in this amount between fireproof and non-fireproof buildings. The Commission is of the opinion that a minimum of 36 square feet of floor space for each person in a non-fireproof factory building, and of 32 square feet for every person in a fireproof building, is a fair allowance. This limitation is to apply generally to all factory buildings, and to take the place of the provision requiring 250 cubic feet of air space, now in force. That the present provision is inadequate even for the purpose for which it was designed, namely, to furnish sufficient ventilation, is generally conceded. This recommendation of the Commission will therefore not only prevent congestion and overcrowding, but it also guarantees better ventilation.

A careful study was made of the practical effect of this provision, so far as reducing the number of operatives allowed in factory buildings is concerned. While it will prevent overcrowding, it will not in the opinion of the Commission unreasonably decrease the number of persons permitted to be employed. For example, a building 25 x 80, under the present provision of the Labor Law, would have a capacity of 80 employees per floor. Under the provisions recommended the number of employees per floor would be reduced to about 55 in a non-fireproof building, and to about 62 in a fireproof building.

ACCORDING TO SIZE AND NUMBER OF EXITS.—The Commission is of the opinion that while limiting the number of occupants according to the number of square feet of floor space would be a sufficient provision in the case of many buildings, yet where there are insufficient exits and inadequate means of extinguishing or preventing the spread of fire, some other restrictions should be made. Long consideration was given by the entire Commission and by sub-committees to this problem, and consultations were had with many experts and authorities, all of whom gave their services without compensation.

The existing buildings have all been constructed without any regard to the number of persons who were to occupy them. In fact, when they were constructed, it was not supposed that many of them would be occupied for manufacturing purposes. Great sums of money have been expended by the owners for their erection and maintenance, and the problem which confronted the Commission was how to effect the safety of those employed therein and yet not deal too severely with the owner or occupant of the building.

The temptation to be drastic in this matter is obvious. The Commission, however, believes that the recommendations which it makes in this regard will be found fair to the employer and employee, and if put into effect, will at the same time reasonably protect life.

The Commission concluded to further gauge the number of occupants by the size and number of exits provided; the number to be increased proportionately if the owner or tenant provided additional exits or means of extinguishing and preventing the spread of fire.

The capacity of the stairway as a means of exit is limited by its height and width, and it is self-evident, therefore, that the number of persons occupying the building must bear some relation to the stairways in the building. After personally inspecting numerous buildings and stairways, and after mature consideration and conference the Commission decided to recommend that the number of persons permitted to occupy any floor of a factory building above the ground or first floor should be limited to 14 persons for every eighteen inches in width of stairways provided, and for every additional 16 inches over 10 feet in height of ceiling from floor, one additional person should be permitted. For ex-

ample, if the stairway was 18 inches wide and the space between the floor and the ceiling was 16 inches over 10 feet, 15 persons would be permitted on each floor of the building. If the stairway was 3 feet wide, as is usual, and the ceiling was 11 feet and 6 inches above the floor, 30 persons would be permitted on each floor.

If there is a landing place at the head of the stairs enclosed in fireproof walls, or partitions, with a fireproof door, this number will be increased by the number of persons who may be able to stand in this landing place, allowing three square feet for each person.

This allowance is based upon the assumption that it is safe to permit on any floor such additional number of persons as can safely find lodgment in case of fire, in a place which is partitioned off by a fireproof wall or partition from the loft itself, where the fire is likely to occur.

The occupants in this way find at once a zone of safety, the partition wall resisting the fire long enough for the employees to escape.

The number of persons allowed on the basis of the width of the stairways may be doubled if an automatic sprinkler system is installed.

The sprinkler system is conceded to be the most efficient means of rapidly checking the spread of fire in its incipiency. While it does not in itself afford an additional means of escape, yet by keeping the fire in check and confining it to a small space, it is recognized as one of the best indirect means of permitting escape from fire. It is for this reason that the number of persons on a floor may be doubled if a sprinkler system is installed.

Where there is a firewall with doors not less than thirty-six inches wide, with a stairway on each side thereof, the number may be increased by the number of persons who may be able to stand in the smaller of the two spaces divided by the firewall, allowing three square feet for each person. Firewalls are an effective means of preventing the spread of fire, and thus afford a ready means of escape. The firewall practically divides the building into two parts; one part in most cases would be unaffected by the fire for a period long enough to enable the occupants of the entire building to escape.

The next alternative is what might be called the adoption of the firewall principle, but is much simpler and less expensive if it can be put into practice. That is for the occupant to obtain access to the adjoining building by fireproof doors in the party wall. If this be done, the number of occupants may be increased practically up to the limit allowed according to the amount of floor space for each person, because the only other restriction would be the capacity of the building with which connection was made to accommodate the employees in both buildings allowing three feet of unobstructed floor space for each person. This arrangement would, of course, have to be made by mutual consent, but as in many cases the buildings are in blocks, are of the same height and size, with party walls between, and have floors on a level, this change would be of equal benefit to the owners of both buildings. Instead of breaking through the walls between adjoining buildings, an even simpler and still less expensive method can be adopted. A fireproof balcony may be built from the exterior of the building either to the adjoining or to the opposite building. This would cost very little, and would be of benefit to both buildings, and as it would allow the increase of the number of employees permitted according to the width of the stairways (*viz.*, 14 persons for every 18 inches in width of stairway), the Commission believes it will be adopted in many cases.

The Commission on this subject makes the following recommendations:

*Posting.* In every existing factory building which is regularly occupied by more than fifty persons above the ground or first floor, the Fire Commissioner of the City of New York and the Commissioner of Labor in the other cities of the State, shall cause to be posted notices or placards specifying the number of persons that may occupy each floor in said building. One such notice is to be posted in a conspicuous place near the entrance door to each floor, and in conspicuous places on each floor in said building.

If any floor is occupied by more than one tenant, two such notices are to be posted in the space occupied by each tenant. All such notices shall be dated as of the date when posted.

In case more persons occupy any floor or floors than are specified in the said notices, the Fire Commissioner of the



City of New York, and the Commissioner of Labor in the other cities of the State, shall notify the tenant or tenants on such floor, and the owner of the said building, on a form regularly printed for this purpose. Said notice shall include an order to the tenants and owner that the number of occupants of said floor or floors must be reduced to the number specified.

*Number of Persons who may Occupy any Floor.* The number of persons who may occupy any floor in any factory building or manufacturing establishment above the ground or first floor shall be as follows:

(a) *General limitation applicable to all buildings, irrespective of exit facilities.*—There shall be at least 36 square feet of floor space on each and every floor of a non-fireproof factory building for every person employed thereon. In every fireproof factory building there shall be not less than 32 square feet of floor space for each person so employed thereon. A fireproof building within the meaning of any of these recommendations is any building that is constructed so that its walls are of brick, stone or concrete; its floors and roofs are of brick, terra cotta, reinforced concrete, or other approved incombustible material placed between steel or reinforced concrete beams; all steel entering into its structural parts is thoroughly incased in at least two inches of fire-resisting material; its interior partitions are entirely of incombustible material; its stairs and stair landings are entirely of brick, stone, concrete, iron or steel; and all stairs, elevators and other vertical communications between floors are solidly enclosed in shafts of fireproof construction.

(b) *Limitation based upon exit facilities.*—Fourteen persons for every eighteen inches in width, of stairways provided, shall be allowed on a floor. For every additional sixteen inches over ten feet in height of any floor, there shall be allowed one additional person.

(c) Where there are landing places enclosed in fireproof walls or partitions, and separated from the loft or manufacturing establishment by fireproof doors of standard fireproof construction, such additional persons may be employed on each floor as can be accommodated by the landing place or places aforesaid, allowing three square feet for each person.

(d) Where a firewall or walls are constructed with a door or doors not less than thirty-six inches in width, such additional number of persons may be permitted on each floor as can be accommodated in the smaller of the two spaces formed by the firewall on the basis of at least 3 square feet of floor area per person; provided, however, that there shall be stairway facilities on each side of said firewall, and that the clear spaces on each side of the said firewall are of sufficient area to accommodate the occupants of the adjoining space in addition to its own occupants on the basis of at least three square feet of floor area per person.

(e) When the firewall principle is adopted — that is fireproof connections made with an adjoining or near-by building — such additional number of persons may be permitted on each floor as can be accommodated in the adjoining or near-by building, allowing 3 square feet of floor area per person.

(f) Double the number of persons allowed under subdivision (b) of this section may be employed when there is constructed or installed on each and every floor of said building an automatic sprinkler system in the form and manner approved in the City of New York by the Fire Commissioner, and elsewhere throughout the State by the State Fire Marshal; provided, however, that in no event shall there be more persons permitted on any floor than would allow not less than 36 square feet of floor space for every person on such floor in a non-fireproof building, and 32 square feet of floor space for every such person in a fireproof building, as hereinbefore provided.

One year is to be allowed for compliance with these requirements. This time may be extended by the Fire Commissioner in New York City, or the Commissioner of Labor elsewhere, for a further period not exceeding one year for good cause shown.

#### *Buildings with Unenclosed Wooden Stairways.*

Proof was given that many wooden stairways unenclosed or enclosed by non-fireproof partitions exist in factory buildings. In many cases they wind around hoistways or elevator shafts. When

a fire occurs, it spreads through these stairways like the flame through a chimney, and renders escape by means of the stairs impossible. The Commission believes it would be too great a hardship to order the wooden stairs removed and fireproof ones erected. It believes that a fair amount of safety will be obtained by requiring that these staircases be enclosed by fireproof partitions or walls. This measure will, in most cases, permit the occupants to descend the stairs in safety, the fire being checked at the entrance to the stairs. Doors leading to these halls and stairways must, of course, be made fireproof.

The Commission is of the opinion that where there are only a few people in the building this precaution would be unnecessary, and therefore recommends that these fireproof partitions or walls should be required only in buildings where there are more than fifty people employed above the ground floor.

The Commission is also of the opinion that in such factory buildings with unprotected wooden stairways exterior fire-escapes of the required size and construction should be installed if not already on the building. The following recommendations are made:

*Unenclosed wooden stairways.*—In all factory buildings or manufacturing establishments in which more than fifty persons are regularly employed above the ground floor or first story, and in which there are unenclosed wooden stairways, the said stairways shall be properly enclosed by partitions of fireproof or fire-resisting material in the form and manner approved in the city of New York by the Bureau of Buildings, and Fire Commissioner, and elsewhere throughout the State by the Commissioner of Labor and local Fire Marshals, and all doors leading from the work rooms of manufacturing establishments to said stairways shall be of standard fireproof construction.

Exterior fire-escapes shall also be constructed on all such buildings save, however, that existing outside fire-escapes will be accepted where the balconies are not less than three feet in width, with stairways connecting the balconies placed at an angle of not more than sixty degrees, with a suitable goose-neck ladder or stairs leading to the roof, and a balanced drop ladder of sufficient length, reaching from the lowest balcony

to a safe landing place beneath, provided that from the said landing place, there be a free and unobstructed exit, either by means of a door in the fence leading to the adjoining premises, or a fireproof passageway leading to the street.

One year is to be allowed for compliance with these requirements. This time may be extended by the Fire Commissioner in New York city, or the Commissioner of Labor elsewhere, for a further period not exceeding one year, for good cause shown.

### *Buildings to be Erected in the Future:*

As to buildings to be erected in the future, the Commission is of the opinion that buildings over two stories in height and in which more than twenty-five persons are employed should be fireproof if used for factory purposes. That is to say, they should comply with the conditions now provided by the Building Code of the City of New York for buildings more than 150 feet in height.

The entire interior finish of the factory building should be fireproof. The floors, the doors, the trim, the partitions, all should be of fire-resisting material. In that case, if a fire occurs in a rubbish heap, it will burn itself out without spreading throughout the floor or from floor to floor. After investigation, the Commission is of the opinion that the added cost of making a building fireproof is so small as to be negligible, and that at any rate the builder will be reimbursed to a large extent by the lessening of insurance premiums. All builders who were consulted were of the opinion that a provision of this kind would be of great benefit, and would not entail any serious hardship.

The spread of fire in loft buildings is very often accelerated by the presence of wooden partitions dividing the lofts. The Commission at first felt that something should be done to remedy these conditions in existing buildings, but as these partitions have all been erected with the permission of the authorities, and as their removal would entail great hardship and expense and would, in the opinion of many experts, not confer any substantial benefit, the Commission finally decided not to make any recommendations upon this point at present. In buildings to be erected in the future, the Commission is of the opinion that no non-fireproof partitions should be permitted.

In conclusion, the Commission believes that a State Building Code should be enacted, and hopes to be able to present such a Code at some future time to the Legislature. This will provide more careful regulations with regard to the erection of factory buildings.

## FACTORY INSPECTION

### LABOR LAW PROVISIONS.

The Labor Law provides that there shall be a Bureau of Factory Inspection with a Chief and First Deputy Commissioner and 85 Inspectors (of whom not more than 15 shall be women). The Commissioner of Labor is directed to divide the State into districts, assigning one inspector to each district, with power to transfer inspectors from one district to another, and with power to direct special inspections. Power is given to the inspectors to enter any factory building, and to the Commissioner to enforce any municipal ordinance, by-law or regulation relating to factories, in addition to the provisions of the Labor Law.

The law directs the Commissioner to visit all factories, "during reasonable hours as often as practicable," and to enforce the provisions of the Act.

### DUPLICATION OF WORK.

In the cities of the second class where the supervision of factories is under the charge of the Commissioner of Public Safety, there is little or no co-operation between the various city officials. This is partly true in cities of the first class.

In the City of New York the Building Department, Health Department, Tenement House Department and Fire Department have authority of some kind over buildings which are used for factory purposes, and at the same time the State Labor Department has partial authority for some purposes over the same buildings. For instance, the Health Department of the City of New York and the Labor Department have apparently concurrent jurisdiction over bakeries. The State Labor Department in some instances, when its inspectors find violations which exist under local ordinances or laws, notifies the proper local Department. The local Departments claim also that in some cases where they find violations of the State Labor Law, they notify the State Labor Department. But there is very little real co-operation.

This duplication of authority is a great evil. The responsibility being divided, no one Department or official as a rule as-

sumes it, and consequently often nothing is done to remedy patent violations of the law. There is a waste of effort by all concerned.

The Commission is not able at this time to make any specific recommendation in this connection. It considers it necessary to study the situation more carefully before it can present a practical system in which departments are effectively co-related.

#### PRESENT METHODS OF FACTORY INSPECTION.

The last Legislature substantially increased the force of factory inspectors, and authorized the employment of supervising inspectors and a mechanical engineer. At this time the additional inspectors have just been appointed, so it cannot be said what the results will be. In his annual report for the year 1911 the Commissioner of Labor says:

“No claim is herein set up that the Bureau has been able to compel the maintenance of proper supervision at all times in every place falling within its jurisdiction. I can only repeat what was said before, that one or two visits a year are not enough. We cannot by such insufficient observations find out infractions of the law and apply the remedies. The Legislature of 1911 provided for a substantial increase in the field and office staff of the Bureau, but even when fully equipped according to the improved plan of organization, its field force will remain inadequate to enforce the law.”

Each inspector under the present system is required to give four hours each day to field work, but apart from this, seems to pursue his work in his own way. With the exception of New York city, there is no sub-office where inspectors may be found. A number of the inspectors testified before the Commission and gave accounts of how they performed their work and the manner and substance of it.

The Commissioner of Labor assigns one inspector to each district, usually to the city or locality in which he lives and where he has been, in many cases, a life-long resident.

Each factory is usually inspected but once a year, the inspectors claiming they are unable to make more inspections because of the great number of factories. The inspectors keep their own records and lists of the factories in their districts. They testified

that they had no way of locating new factories except by chance. It was stated that some factories have been in existence for years without ever having been inspected.

It was claimed that in many cases the inspector's visit was known beforehand. The average inspector first visits the office, obtains some statistical information, and then, in company with the proprietor or his representative, goes through the manufacturing department. Employees testified that this method of inspection prevented them from complaining to the factory inspector of violations of law. Testimony was given to the effect that on some occasions while the inspector was in the office interviewing the employer, various immediate changes, involving certain violations, were effected, exits cleared, and general cleaning done, so that the place presented a decent aspect when the inspector finally appeared. A witness testified that children working illegally were removed from the building either before the inspector arrived or while he was in the office interviewing the proprietor, and that in some cases the children were put in the elevators, which were lowered so they were between the floors and could not be seen.

In each case, the inspector fills out a form in duplicate showing the results of his inspection and sends it to the home office. The clerical work takes about one-half the working day of the average inspector.

#### PROCEDURE IN CASE OF VIOLATION.

##### 1. VIOLATIONS FOUND BY AN INSPECTOR.

The inspector reports a violation of law to the home office, and if that office approves, a notice is sent to the offending manufacturer calling his attention to such violation and directing him to remedy the same within a specified time, usually thirty days. A copy of this notice is sent to the inspector.

In the course of time the inspector visits the offending manufacturer to ascertain if he has complied with the notice. If he finds he has not, he reports a second time, and the Department again notifies the manufacturer that he must comply. The inspector again visits the offending manufacturer to ascertain if the



notice has been complied with. If he finds that it has not, he notifies the Department once more, and the matter is then referred to counsel.

Mr. Cunningham, counsel for the Labor Department, testified before the Commission. From October 1st, 1910, to September 30th, 1911, there were 413 separate charges of violation of the law, in which there were 246 convictions. Fines were imposed in 95 cases; sentence suspended in 151. The procedure is this: If the manufacturer fails to comply with the notices to remedy the violations of law, the matter is then referred to counsel. The counsel, sometimes after conferring with the inspector in charge and sometimes simply on proof that the orders have not been complied with, sends a written communication to the manufacturer informing him that unless he complies he will be sued or prosecuted criminally. When a certain number of days has expired, the counsel sends an inspector to ascertain if the orders have been complied with. If the notices have been disregarded it becomes the inspector's duty to find the owner or his agent, confer with him personally and ascertain whether he will comply with the notice. The purpose of such personal interview with the owner or his agent is to establish the responsibility of such person with respect to the Department's order. A warrant is then obtained and the offending party is brought to court. In the meantime a long delay frequently occurs, and the premises remain in their unlawful condition sometimes three or four months. Upon the return of the warrant, if the factory owner pleads not guilty, the case is held by the Magistrate for the Court of Special Sessions or corresponding court. This necessitates additional delay, and when the case comes up for hearing there are usually several postponements. When the case is finally reached for trial, several months may have elapsed since the first notice was served upon the manufacturer. The manufacturer appears on the final day of adjournment, informs the Court that he has performed the work, pleads guilty and is usually discharged or sentence suspended.

It also appeared that after the warrant is obtained no inspections are made by the Department until the case has come to trial, and then if the manufacturer states that the work has been done the

case is dismissed or another adjournment is taken in order to permit an investigation to see if the statement is true.

Mr. Cunningham testified to a typical case of delay. A manufacturer was ordered on January 30th, 1911, to light the halls and place the toilets in a sanitary condition. The warrant for his arrest was issued on the 26th day of June, 1911, six months after the first notice was sent. During all this time the conditions complained of continued to exist. The defendant was arraigned on July 7th, 1911. Adjournment was had until August 2nd, when he was held for the Court of Special Sessions. On October 2nd, 1911, the defendant pleaded guilty and was ordered to appear for sentence on the 9th day of October. Then the inspector of the Labor Department reported that the conditions had been remedied, and the Court suspended sentence.

It was suggested that this condition could be remedied by simply obtaining a summons for the owner when the Department reported that its notices had been disregarded by the manufacturer. The owner would then in all probability have the work done at once under notice that if he did not, a warrant would be issued. No reason was advanced why this procedure should not be adopted.

In the matter of doors opening inwardly, there was only one action during the fiscal year ending September 30th, 1911, only ten actions for locked doors during the same period, and only one prosecution for obstructed passageways leading to a fire-escape. In the one prosecution for doors not opening outwardly, the Court suspended sentence after several months' delay. The prosecutions for locked doors resulted in seven fines and three suspended sentences. The majority of these prosecutions were after the Triangle Waist Company fire.

With reference to prosecutions for child labor, when the defendant employs more than one child illegally, separate complaints are made against the manufacturer in each case. It is apparently the practice of some judges to convict upon one case and suspend sentence in others, and this, the Commission believes, accounts for the large number of suspended sentences.

2. COMPLAINTS MADE TO THE DEPARTMENT.—In many cases persons interested complain of specific violations of the law in vari-

ous factories. These complaints are sometimes in writing and sometimes are made orally to different inspectors and authorities. Oral complaints receive no special attention, the Department only classifying written communications as complaints. Written complaints sent to the home office at Albany are referred to inspectors, who are directed to make special investigations to ascertain if the complaints are justified. If they are justified, the same course of action is taken as when the inspector finds the violation without complaint. Mr. Charles Yates, testifying before the Commission, gave a typical case. He complained on December 3rd, 1909, to the factory inspector in Syracuse about improper conditions there. He made three specific complaints. When he called the attention of the inspectors to violations of the law they told him that he must first lodge his complaints at Albany. He testified that he had objected to the needless exaction of a written complaint, to the Commissioner of the Labor Department, and produced a letter from the Commissioner, which is in evidence, in which the Commissioner informs him that it is necessary for the proper supervision of the affairs of the Department that complaints be lodged directly with his office. The Commissioner of Labor states that he has not permitted oral complaints to be made because of the danger of such complaints not reaching him on account of forgetfulness or being overlooked by the inspectors, but he informs the Commission that the new supervising inspectors will be allowed to receive complaints directly. Oral complaints to the inspectors should be encouraged, in order that they may be informed of the facts. The Labor Department and the inspectors should welcome facts with reference to any violation, no matter how received.

#### DIVISION OF MEDICAL INSPECTION.

In addition to the other inspectors, a physician is appointed as medical inspector of factories in the Labor Department. He has no regular assistants, though a factory inspector is detailed to help him.

He examines factories in order to ascertain the danger of poisoning or disease resulting from the various processes of manufacture, makes special investigations, and also does some research work. The Department, however, has no authority to make a

physical examination of the workers. Practically no educational work is done by the Department of Labor, either by issuing pamphlets of instructions to employers and employees on dangers in different industries and the means of avoiding them, or by instructing the inspectors so to inform the workers. Abstracts of the Labor Law are posted only in the English language, though in many cases the employees are not able to read English, even if they understand the spoken language.

Dr. C. T. Graham-Rogers, the medical inspector, with the consent of the Commissioner of Labor, rendered valuable service to the Commission.

#### MUSEUM OF SAFETY.

Public-spirited citizens have maintained in the City of New York a Museum of Safety, wherein is exhibited safety devices of all kinds to be placed upon machinery, and to be worn and used by employees.

In most of the European countries such a museum is maintained by the Government. The advisability of the establishment of such a museum as a branch of the State Department of Labor is a matter that should be carefully considered.

Further, the Department of Labor should at any rate issue from time to time descriptive pamphlets to employers and employees, informing them fully of all newly discovered or invented safety devices, giving instructions in their use and application, calling attention to dangerous accidents and means of avoiding them, and impressing upon both employer and employee the importance of these safety devices.

The attitude of the State of New York in dealing with these problems should be that of a teacher, conservator and guide, and not that of a police officer attempting either to detect or to arrest a criminal.

#### FURTHER INVESTIGATION BY THIS COMMISSION AS TO FACTORY INSPECTION.

It is substantially conceded that the present system of factory inspection is totally inadequate. No doubt this condition is partly

due to the lack of a sufficient number of inspectors and adequate means of determining what factories exist or where they are located.

Duplication of inspections by State and local Departments should be avoided, and there should be more co-operation between the local Departments in the various cities and the State Department of Labor. There should be better and closer supervision of inspectors, and a higher grade of inspectors, with technical training, should be attracted to the service of the State. This would probably involve an increase in salaries, and the establishment of a new grade of assistant supervising inspectors. There should, of course, be far more frequent inspections. These should be made at irregular intervals, without previous knowledge by the manufacturer, and the factory proper should be inspected before the manufacturer is called upon for any information. Inspectors should spend more time in inspection and less in clerical work.

Cities of the first class and the larger cities of the second class, should have sub-offices in the real sense of the word, with a supervising inspector permanently established in charge. Records of the factories in those cities should be kept in these sub-offices. All violation orders affecting that locality should come from the sub-office, and factory inspection in that locality should be directed from the sub-office. An educational campaign should at once be begun to instruct both employer and employee as to what should be done and what should be avoided to make the life of the employee healthful and to avoid danger.

As to the Labor Law itself, the Commission feels that more power should be given to the Commissioner to provide for specific cases by rules and regulations and that the law should not attempt to cover every detail.

The law relating to safeguards upon machinery should be improved and extended so as to cover not only machinery, but dangerous fumes and chemicals. A system for the more comprehensive safeguarding of elevators should be devised, particularly so-called "freight elevators." These, while ostensibly only to be used for carrying freight, are used for the carrying of great numbers of operatives in factory and loft buildings.

A Board of Experts should be established, which, together with the Commissioner of Labor, should have the power to formulate

and enforce rules and regulations upon the subjects of sanitation and accident prevention in all their phases and applying to all industries.

Provision should be made for the appointment of trained inspectors. It was quite apparent that many of the inspectors do not possess the technical training necessary for competent treatment of the intricate problems of safeguarding machinery.

The Division of Medical Inspection should be increased and strengthened.

Above all, delay in enforcing the law should be avoided, and the wrongdoer promptly and speedily punished.

These matters present very serious questions for consideration, and the Commission hopes that during its extension it will be able to make recommendations looking towards the improvement of the entire system.

#### REGISTRATION OF FACTORIES.

The Commission will make but few recommendations under this subject at this time, but after careful investigation, it believes that registration should be required of all factories in order that the Department of Labor may be informed as to the ownership and location of every factory in the State. This is done in almost all European countries. The following are the countries in Europe which require such registration:

Germany: §§ 138, 139b, par. 5 of the Industrial Code, the Police Orders relating to the giving of notice to the inspectors and the Imperial Order of 9th July, 1900, R. G., B1, p. 565ff.

Austria: § 11 of the Industrial Code.

Denmark: § 2 of the Factory Act of 1901.

Finland: § 2 of the Industrial Code of 31st March, 1879, and 17 of the Industrial Inspectors Instructions of 31st December, 1889.

United Kingdom: § 127 of the Factory and Workshop Act of 1901; factories and workshops only.

Hungary: § 4 of Act No. XVII of 1884.

Russia: §§ 69-74 of Industrial Code; factories to be licensed.

Norway: § 3 of the Act of 10th September, 1909.

Sweden: § 9 of the Act of 18th June, 1864.

Switzerland: § 3 of the Factory Act of 1877.

## RECOMMENDATIONS.

*Registration of existing factories.*—The owner of every factory shall be required to register with the Labor Department within six months from the date of the passage of this act, giving the name, home address of the owner, the address of the business, the name under which it is carried on, the number of employees and such other data as the Commissioner of Labor may require. Such registration shall be upon a form furnished by the said Commissioner.

*Registration of new factories.*—The owner of every factory shall be required to register with the Labor Department within thirty days after he begins business, giving the name and home address of the owner, the address of the business, the name under which it is carried on, the number of employees and such other data as the Commissioner of Labor may require. Such registration shall be upon a form furnished by the said Commissioner.

The Commission also recommends that abstracts of the Labor Law and the provisions thereof applicable to factories which are now posted in the English language, should be posted in large type and simple words in such foreign languages as the Commissioner in his discretion may deem advisable.

## SUMMARY POWER OVER UNCLEAN FACTORIES.

It is apparent that where a factory is found to be unclean and insanitary, there should be summary power conferred upon the Commissioner of Labor, the exercise of which will result in the speedy and effective remedying of the conditions complained of. This power is in part conferred by section 95 of the Labor Law, which authorizes the Commissioner of Labor to place the unclean tag on any of the articles specified in section 100 of the Labor Law (41 in number), exposed to contagious disease or in an unclean or insanitary workroom in any tenant factory.

The Commission believes that this power to affix the unclean label should be extended to apply to any articles found exposed to contagion or in an unclean or insanitary workroom in any factory.

There is no valid reason for limiting the exercise of the power to the case of tenant factories, or to the 41 specified articles.

Testimony was given of foul and insanitary workrooms in which human hair goods were prepared, yet because those articles are not specified in section 100, the Commissioner of Labor was powerless to force the immediate correction of the defective conditions and was obliged to resort to legal proceedings.

The Commission, therefore, recommends the amendment of section 95 of the Labor Law so that it reads as follows:

Sec. 95. *Unclean (tenant) factories.*—If the Commissioner of Labor finds evidence of contagious diseases present in any (tenant) factory (in which any of the articles enumerated in section 100 herewith are manufactured, altered, repaired or finished) he shall affix to any (such) articles *therein* exposed to such contagion a label containing the word “unclean,” and shall notify the local board of health, who may disinfect such articles and thereupon remove such label. If the Commissioner of Labor finds (any of the articles specified in said section 100) in any workroom or factory (in a tenant factory) which is foul, unclean, or unsanitary, he may, after first making and filing in the public records of his office a written order stating the reasons therefor, affix to (such) *any* articles *therein found* a label containing the word “unclean.” No one but the Commissioner of Labor shall remove any label so affixed; and he may refuse to remove it until such articles shall have been removed from such factory and cleaned, or until such room or rooms shall have been cleaned or made sanitary.



## SANITATION OF FACTORIES AND MANUFACTURING ESTABLISHMENTS

### CLEANLINESS.

Cleanliness is naturally the first necessity of a proper workplace, yet the great majority of factories examined by the Commission were found to be in an uncleanly condition. Of the 10,000 workers employed in the establishments examined by Miss Goldmark, 7 per cent were found working in clean and well-kept workrooms, 58 per cent in fairly clean and well-kept workrooms, 31 per cent in dirty workrooms, and 4 per cent in very dirty workrooms. There seemed to be no difference in this regard between establishments in the city of New York and elsewhere throughout the State.

The Commission found that establishments manufacturing food-stuffs were the dirtiest of all. Forty-five per cent of all the establishments inspected by the Commission were either in a dirty or very dirty condition. Only a very small number could be denominated as entirely clean shops.

### SANITARY NECESSITIES.

The condition of the toilets in most of the factories was very bad. The flush was usually found to be inadequate. Very often the plumbing was out of order. The ventilation of these compartments was usually poor. Their position as regards the rest of the factory floor was improper, and very many of them were dark. Of those inspected by the Commission, 24 per cent were dirty and 16 per cent were very dirty. These deplorable conditions apply not only to the small establishments. Some of the largest industrial establishments are at fault. Of the group of buildings examined by Miss Goldmark, 3.5 per cent of the toilets were found to be in back yards, 9 per cent in halls, and 87.5 per cent in compartments or rooms connected with the workrooms.

The present law is general, and simply provides that there should be a sufficient number of toilets for the use of workmen.

## VENTILATION.

The problem of securing proper ventilation in factory buildings is one of the utmost importance. The necessity for furnishing fresh and pure air in our homes has long been appreciated. It is of still greater importance in factories, where a large number of persons are employed, and where the materials and processes often generate dust, noxious gases and fumes, which are permitted to mingle with and contaminate the air in the entire establishment.

Of all the establishments inspected under the supervision of the Commission, only 14 per cent attempted to secure proper ventilation by means of mechanical devices for the removal of bad air, or for the introduction of a regular supply of fresh air. The remaining 86 per cent relied solely on the windows for their ventilation. In cold weather the windows were, of course, closed and failed to serve their purpose as mediums of ventilation.

The present provisions of the Labor Law on the subject of ventilation are, it is generally conceded, entirely inadequate. Section 86 of the Labor Law simply requires that proper and adequate ventilation shall be furnished in all factories and manufacturing establishments. No standards are set. No working test is provided in the law by which the amount of impurity existing in the air can be determined.

A cubic space of 400 feet for each adult worker should be insisted upon in all factories, with the additional standard of a floor space of from 32 to 36 square feet per person, and the passageways already provided for.

This, of course, while relieving the congestion and incidentally affecting the purity of the air in the workroom, does not solve the problem of ventilation. It is necessary that some means be provided for a constant renewal of all the air in the workroom in which manufacturing is carried on, and that provision be made for the removal of dust, gases and fumes at their point of origin to prevent them from mixing with the air breathed by the workers. The importance of the latter provision can readily be appreciated when it is considered that the so-called "dusty trades" furnish over 60 per cent of the victims of tuberculosis among factory workers.

As to general ventilation in factory buildings, the Commission is not yet ready to set forth definite standards and requirements.

The preliminary investigation conducted by the Commission shows that there is at present no unanimity of opinion among experts as to what these standards should be. It is conceded that the present ventilation in factory buildings is entirely unsatisfactory. The methods to be adopted to remedy this condition will have to be determined as a result of further study and investigation.

As to humidity, testimony was given by Prof. C. E. A. Winslow, an acknowledged expert on ventilation, that a dry bulb temperature above 75° F. and a wet bulb temperature above 70° are extremely injurious to health. Many places were found where this temperature was greatly exceeded, while in some instances a dry bulb temperature of 98° F. and a wet bulb temperature of 90° were found.

Naturally, these conditions predispose to tuberculosis and other respiratory diseases. Pulmonary tuberculosis was found by the Commission to be especially prevalent among garment workers, printers and cigarmakers, because of the crowded workrooms and absence of ventilation. There should be a standard as to the degree of temperature permitted in the workroom. Power should be given to the Labor Department to enact and enforce rules in industries where extremes of temperature are likely to occur, and self-recording thermometers should be maintained.

The entire subject of ventilation must be approached with a spirit of fairness to all concerned. Ill-considered standards would mean unnecessary and useless expense without accomplishing anything. In the case of the public schools, which present a comparatively simple problem of ventilation, the use of mechanical means has caused much criticism. It is stated, however, that the reason for the failure of the system is that those in charge do not understand how to keep it in working order, and that it works admirably if kept in perfect order.

The experts consulted by the Commission recommend that forced ventilating systems should be adopted in all manufacturing establishments. The Commission desires to give the matter further study, in order to ascertain whether it is possible to lay down a standard in the law for all industries, or whether special rules and regulations should be fixed for the different industries. If a standard can be set, the Commission desires to be in a

position to inform the manufacturer just what means will have to be adopted to comply with that standard.

#### LIGHT AND ILLUMINATION.

There is no standard whatsoever as to light and illumination in factories. Defective light and illumination are known to be injurious to the eyes of the worker. Insufficient light causes eye-strain, and gradually undermines the general health. Investigation showed that 52 per cent of the factories inspected used artificial light during the daytime, and the light, even where sufficient, was improperly placed with relation to the workers. Often the lights were too near, and no protection was given from glare. This is true, not alone in the small shops, but in the larger ones. Mr. E. L. Elliott, an illuminating engineer, testified that the brilliancy and intensity of light could be measured by a recently invented machine, and that therefore it would be easy to fix proper standards of light.

The Commission desires to give this matter study and thought, so as to be able to make appropriate recommendations.

#### RECOMMENDATIONS.

Section 86 of the Labor Law contains a provision for the removal of dust, gases and fumes generated in the processes of manufacture. This provision, as it stands, is inadequate, and, according to the testimony of the Medical Inspector of Factories, is incapable of enforcement.

The Commission, however, feels it can safely recommend the following amendment, so that the latter portion of section 86 shall read as follows:

If excessive heat be created, or if steam, gases, vapors, dust or other impurities that may be injurious to health, be generated in the course of the manufacturing process carried on therein, *proper hoods and pipes connected with an exhaust fan of sufficient capacity and power to remove such dust or impurities at their point of origin and prevent them from mingling with the air in the room, shall be provided. Such fan shall be kept running constantly while the dust, gases and fumes are being generated.*

## OCCUPATIONAL DISEASES

The subject of disease caused by the occupation of the workers presents a vast field for study and investigation. Morbidity statistics in this country are entirely inadequate.

A large number of industries deal with harmful or poisonous materials which are liable to endanger the health and life of the workers. Some of these poisons could be entirely eliminated by the substitution of non-poisonous materials, as in the case of the phosphorous match industry and others. The means of preventing many of these diseases is apparently the education of both employer and employee in regard to the dangers involved, as many of them are at present absolutely ignorant of the effects of the various poisonous matters.

The Commission has been able to give but brief attention to this important subject, and has investigated only one form of occupational disease,—that known as “lead poisoning.”

### LEAD POISONING.

The preliminary investigations conducted for the Commission by Prof. E. E. Pratt show that the methods by which these industrial poisons may enter the system are three:

1. Through the mouth and digestive system.
2. Through the respiratory system.
3. Through the skin.

In the lead factories, meals were eaten by the employees in the workrooms where the poisonous materials were used. No adequate washing facilities were provided, and no adequate provision made for the removal of the poisonous dusts, gases and fumes at their point of origin, so as to prevent their inhalation by the worker.

The results of the investigation clearly indicate the necessity for the following provisions and safeguards:

1. The prohibition of the eating of meals in any working room where any poisonous dust, gases or fumes are generated in process of manufacture.

2. The mandatory requirement of ample washing facilities, including hot water, in all factories where such poisonous materials are used.

3. An adequate system of forced ventilation to remove the dust, gases and fumes at their point of origin.

The last requirement has already been included in the recommendations made by the Commission with regard to amending section 86 of the Labor Law.

#### RECOMMENDATIONS.

The Commission at this time, therefore, recommends the following amendments to the Labor Law:

Amend section 88 of the Labor Law by adding thereto the following provision:

In all establishments where lead, arsenic, or other poisonous substances or injurious or noxious fumes, dust, or gases are present as the result of the business conducted by such factory, there shall be provided ample washing facilities, including hot water and individual towels.

Amend the Labor Law by adding a new section, to be known as section 89a:

*Prohibition of Eating Meals in Certain Workrooms:*  
No employee shall take or be allowed to take food into any room or apartment in any factory, mercantile establishment, mill or workshop, commercial institution, or other establishment or working place where lead, arsenic, or other poisonous substance, or injurious or noxious fumes, dust or gases under harmful conditions are present, as a result of the business conducted by such factory, mercantile establishment, mill or workshop, commercial institution, or other establish-

ment or working place, and notice to this effect shall be posted in each room or apartment. No employee, except where his presence is necessary for the proper conduct of the business, shall remain in any such room or apartment during the time allowed for meals, and suitable provisions shall be made and maintained by the employer to enable the employees to take their meals elsewhere in such establishment.

These recommendations are, however, only a preliminary step. The substitution of harmless substances for poisonous materials used in manufacture where practicable, the licensing of all dangerous trades and occupations, the compulsory physical examination of all workers in such trades, the necessity for special rules and regulations for the different industries affected are matters which require careful consideration.

There can be no doubt that many lives are annually lost and severe illnesses are caused by the failure to take ordinary precautions in using poisonous articles in manufacturing. The greatest cause of sickness and death is ignorance, and the Labor Department should see to it that the dangers, and the means of avoiding them are brought forcibly and unmistakably before both employer and employee.

## BAKERIES

### NUMBER OF BAKERIES IN THE STATE.

According to the Census of 1910, there were in 1909 in New York State 2,962 bakeries employing 13,676 workingmen. The number of bakeries in the cities of the first and second class was as follows:

New York.....	2,489
Buffalo.....	190
Rochester.....	106
Syracuse.....	73
Albany.....	64
Troy.....	41
Yonkers.....	35
Utica.....	28

### JURISDICTION OVER BAKERIES.

In the city of New York, the State Labor Department, the Board of Health and the Tenement House Department have each some jurisdiction over bakeries, and bakeries have been recently inspected not only by the officials of these Departments but also by the Commissioner of Accounts of the City of New York.

The Labor Law contains special provisions for the inspection of bakeries. Local Health Departments are also authorized to investigate and cause the removal of insanitary conditions in bakeries, but there is little or no co-operation between the local and State departments. Dr. Lederle, the Commissioner of Health of the City of New York, testified:

“The trouble about this bakery situation, as I understand it, is that there is a duplication of authority which may or may not be exercised by both departments. Primarily bakeries are under the jurisdiction of the State Labor Department.”



The State Labor Department makes inspections of bakeries about once a year. The criticism as to the inadequacy of factory inspection in general applies with still greater force to bakeries, and in fact to all places where food products are manufactured.

To insure the maintenance of proper sanitary conditions in such establishments, frequent inspection is essential. The number of inspections should depend upon the location and general condition of the establishment, but in any event every bakery should be inspected at least once a month. The Commissioner of Labor should exercise promptly the power conferred upon him by the Labor Law to seal up a bakery found to be so unclean, improperly drained or ventilated as to be insanitary.

#### LICENSING OF BAKERIES.

The principle of State or municipal licensing has already been applied to industries which are dangerous to life because of the materials and processes, such as the manufacture of fireworks, or those which may become a nuisance, such as offensive trades, stables, etc., or others which bear an intimate relation to the public health, such as plumbing, dairy industries and slaughter-houses.

No industry is more closely related to the public health than bread-making. Not one of those who appeared before the Commission, including bakers, objected to the licensing of bakeries. Many testified that it would be of great benefit to the industry. The licensing of bakeries would permit of accurate, periodical inspection, and would be the first step in remedial legislation.

There has been some discussion as to what Department should be given jurisdiction of licensing bakeries, and after considerable thought the Commission is of the opinion that the best interests of all would be conserved by placing this power with the State Labor Department, with the provision, however, that a certificate as to the sanitary condition of the bakery should be obtained from the local Health Department before the State Department shall issue a license. This method will necessitate supervision by both Departments.

## CELLAR BAKERIES.

Most city bakeries have been located in cellars. This condition prevails in Berlin, Paris, Chicago, Philadelphia and Pittsburgh, and prevailed in London up to five or six years ago, when the future use of cellars as bakeries was prohibited. Elsewhere in England new bakeries have been forbidden to locate in cellars since 1895. In the city of New York there are 2,489 bakeries, and according to the report of Commissioner of Accounts Fosdick and his testimony before the Commission, the great majority of these are located in cellars and basements. Of the 485 bakeries inspected and investigated by this Commission, 479 were located in cellars of tenement houses. The ceilings of cellars are rarely more than a foot or two above the ground. This condition results in defective drainage, inadequate light, poor ventilation, excessive humidity, proximity of plumbing, lack of washing facilities, lack of toilet accommodation, uncleanness of workmen and utensils and the presence of domestic animals, vermin and insects. Testimony was given showing that frequently sewage pipes and water pipes leaked or sweated directly upon material of which bread was made; that animals, such as chickens and dogs, were running loose in bakeries, and that employees sometimes slept there.

Further and more detailed description of conditions in these establishments will be found in the testimony given by Miss Perkins, Commissioner Fosdick, Dr. Bensele and Dr. Lederle.

It is evident that a cellar is an unfit place for the manufacture of foodstuffs or for the housing of workers. No place can be sanitary which lacks sunlight. Ventilation is almost impossible unless mechanical ventilation be used, which, in the ordinary small bakery, is not practicable.

Cellars can not be kept as clean as other parts of the house, because they are, as a rule, semi-dark. They contain most of the plumbing pipes and fixtures, and they are naturally the habitation of insects, rats and mice, and are in proximity to breeding places of flies.

The Commission has very seriously discussed the question as to whether all existing cellar bakeries should be abolished, or whether only new cellar bakeries should be prohibited. The

Commission took into consideration the fact that if the existing cellar bakeries were abolished a great many persons would suffer hardship.

The Commission, therefore, is of the opinion that the use of cellars for bakeries and for the manufacture of other food products should not be permitted in the future either in New York city or in any other city of the State.

#### MEDICAL EXAMINATION OF BAKERS.

The Commission conducted the first medical examination of bakers ever made in the city of New York. Six physicians made the examination under the direction of Dr. Price, at the same time that inspections were made of the bake-shops. The greater number of the examinations were made at night. Most of the bakers are men; few women are engaged in this occupation, and very few are young persons. The temperature in bakeries is high, wages are not large, hours of labor are unusually long, and there is much night work.

Of the 800 bakers examined, 453, or 57 per cent, had some indication of a defective physical condition. The most important diseases discovered were pulmonary tuberculosis and bronchitis, 177 cases; pleurisy, 2 cases; venereal diseases, 3 cases; diseases of the skin, 45 cases. A detailed account of the result of this medical examination will be found in the report of Dr. Price in Appendix III.

#### RECOMMENDATIONS:

The Commission makes the following recommendations with reference to bakeries:

*Licensing.*—Every factory or manufacturing establishment where food products are prepared for public consumption (except hotels, restaurants and boarding houses), shall be required to apply for a license from the State Labor Department; the license to be granted after inspection; to be renewed annually; to be revocable for cause; and to be granted only on the certification of the local Health Department that the premises are in a sanitary condition.

*The Power of the Board of Health or Commissioner of Public Safety to make Rules and Regulations Prescrib-*

*ing Standards of Sanitation for Places Where Food Products are Manufactured.*—The Department of Health or Commissioner of Public Safety shall have the power to establish from time to time standards of sanitation for existing and future factories and manufacturing establishments where food products of any kind are manufactured for public consumption (except restaurants, hotels and boarding houses); provision should be made for the public hearing of such proposed rules and regulations before they are adopted and their publication after adoption. No change in any such rules and regulations shall be made except after a public hearing on 30 days' public notice.

*Prohibition of Future Bakeries and Places Where Food Products are Manufactured for Public Consumption from Locating in Cellars*—On and after the date hereof, no new bakery or other establishment where food products are manufactured or prepared for public consumption (except restaurants, hotels or boarding houses) shall be permitted in a cellar. The term cellar within the meaning of this act is hereby defined as follows: Any room in which the distance between the floor and the ceiling is more than one-half below the level of street or ground adjacent thereto.

The Commission has considered the question of medical inspection of bakers, but in this preliminary report does not believe that it should make any recommendation upon the subject. It will again consider the matter, and hopes to be able in its final report to make recommendations with reference thereto.

Proposed laws carrying out these recommendations will be hereafter submitted.

## MANUFACTURING IN TENEMENTS

### PRESENT LEGAL STATUS OF MANUFACTURING IN TENEMENTS.

Manufacturing in tenement houses in the cities of the State presents a problem the importance of which can hardly be overestimated. The problem is now practically limited to the Greater City of New York, the Commission, in its preliminary investigation having found little manufacturing carried on in tenement houses in other cities of the first and second class. Though this finding is supported by the records of the State Labor Department, such work is said to be increasing in all up-State cities.

The subject of tenement-house manufacture has been considered by the Legislature on several occasions. In 1884 the Legislature passed an act prohibiting the manufacture of cigars and cigarettes in tenement houses in cities having over 500,000 inhabitants. This act was declared unconstitutional by our Court of Appeals in the case of *In re Jacobs* (reported in 98 *New York*, page 98). This decision, which has been construed in different ways, need not now be discussed.

From 1885, when the Jacobs case was decided, down to 1892, practically nothing was done to regulate or control manufacturing in tenement houses, and then the conditions under which this manufacturing was conducted made some action imperative. In 1892 an act was passed providing in substance that only immediate members of the family might be employed in dwelling rooms where articles of a specified kind were manufactured, and that no outsider was to be employed in such workroom unless a permit were obtained from the factory inspector setting forth the maximum number to be so employed. This permit was granted after inspection, and was revocable if required by "the health of the community or of those employed therein."

Since then the Legislature has attempted to strengthen this Act, and to regulate rather than prohibit manufacturing in tenement houses. The inadequacy of the law, however, soon became apparent, and in 1899 an act was passed requiring a license for each family workroom, to be granted under the following conditions:

1. The premises must be in a sanitary condition.
2. They must be free from any contagious, infectious or communicable disease.
3. There must be 500 cubic feet of air space per person.

The license was revocable if any of these conditions were violated. This system of licensing continued in operation until 1904, when the licensing of individual workrooms was succeeded by the requirement that the tenement house itself be licensed, the landlord instead of the worker making the application. This was to do away with the renewals of licenses necessitated by the frequent moving of the worker from one house to another.

The present law relating to manufacturing in tenement houses is contained in sections 100-105 inclusive, of the Labor Law. In substance the law provides that a license shall be required for the manufacture, alteration or preparation in tenement workrooms of any of the forty-one articles specified in the act, and that licenses are not to be granted until the records of the Board of Health or other appropriate local authority shall agree with the result of an inspection by the Labor Department in showing the tenement house to be free from infectious, contagious or communicable disease, and from any defect in sanitation. There must be at least 500 cubic feet of air space for each worker, and only members of the family may be employed, save in the case of dressmaking establishments conducted on the ground or first floor. These licensed tenements are to be inspected at least once in every six months and licenses may be revoked if the inspection discloses conditions deemed unhealthful. The manufacturer must keep ready for inspection a list of the names and addresses of all his home workers, and is not permitted to send for manufacture, articles specified in the act, into an unlicensed house, or to any workroom in which there exists any infectious, contagious or communicable disease. The owner of the tenement house is held responsible for the manufacture of any articles mentioned in the act contrary to its provisions. The violation of the law by the tenement-house worker is sufficient ground for the institution of disposes proceedings against him.

## JURISDICTION OVER MANUFACTURING IN TENEMENT HOUSES.

Jurisdiction over manufacturing in tenement houses in the city of New York is exercised by three departments; the State Department of Labor, the Department of Health, and to some extent the Tenement House Department.

The State Department of Labor has general jurisdiction over the issuance of licenses as to the forty-one articles specified in the act, and is responsible for the maintenance of proper sanitary conditions in such licensed houses.

The Tenement House Department has jurisdiction over the sanitary conditions in tenement houses. It exercises such jurisdiction over the tenement-house workroom only in so far as such rooms are used for living purposes. It has no jurisdiction over conditions produced by the manufacturing conducted in them.

The Board of Health has jurisdiction over all infectious, contagious and communicable diseases in the tenement houses. It also possesses general jurisdiction over the sanitary conditions in tenement houses. This jurisdiction is rarely, if ever, exercised, the Board of Health acting only on complaint, and in nearly every case referring complaints to the Tenement House Department.

So far as manufacturing in the tenement houses is concerned, while other departments may have concurrent jurisdiction, the State Labor Department alone is responsible for sanitary conditions and for the enforcement of the law regulating such manufacturing.

## PRELIMINARY INVESTIGATION BY THE COMMISSION.

The Commission in its investigations has not been able to obtain more than a general survey of present conditions, and to prepare a plan for a further investigation. Various witnesses testified to the conditions under which manufacturing is carried on to-day in tenement homes, and a special investigation was made for the Commission by the National Child Labor Committee under the immediate supervision of Mr. Owen R. Lovejoy and Miss Elizabeth C. Watson. Assistance was also rendered by some members of the Women's Welfare Department of the National Civic Federation who investigated tenement house manufacture in one East Side block.

## THE LICENSING SYSTEM AND ITS ENFORCEMENT.

In 1904 there were 2,604 tenement houses in the city of New York licensed for manufacturing. In November, 1911, there were 13,268 licensed tenements in that city, and 451 in the remainder of the State.

In considering the number of tenement houses in which manufacturing is actually carried on in the city of New York the following facts should be borne in mind:

1. Each of the 13,268 licensed tenements contains anywhere from three to forty or fifty different apartments in which manufacturing *may* be carried on.

2. The 13,268 licensed tenements represent those only in which the manufacture or preparation of the forty-one articles specified in section 100 of the Labor Law is carried on. Testimony showed that at least one hundred different articles are in process of manufacture in tenement houses in the city of New York. The preparation or manufacture of almost sixty articles requires no license and may, therefore, be carried on practically without any supervision save that incidentally exercised by the Tenement House Department and the Board of Health.

The investigation showed that the provisions of the law requiring a license for the manufacturing of the articles specified are violated in many cases. Accurate lists of home workers are not kept by the manufacturers as the law requires.

The manufacture of brushes, for example, requires a license. Of 124 families given by brush manufacturers as out-workers, 10 families were found to live in licensed houses, 114 families in unlicensed houses.

Nut picking requires a license. Among the out-workers investigated, 22 families were found living in licensed houses, 19 families in unlicensed houses.

Under the present system, with the force at the disposal of the State Department of Labor for this purpose, the enforcement of the law relating to home work is a hopeless task. Increase in the number of inspectors will help but little.



## EVILS OF HOME WORK.

1. SPREADING OF DISEASE — Manufacturing in tenement homes is often conducted under very insanitary conditions. The photographs reproduced in Appendix 7 are illustrative of the filth and personal uncleanness which exist sometimes in the preparation of food products. Manufacturing and preparation of various articles of wearing apparel and food products are in many cases carried on by diseased workers. The danger from this source, particularly in the case of food products prepared in the tenement homes and distributed widely for consumption requires no emphasis. Cases of work done in tenement homes by children suffering from contagious scalp and skin diseases, chicken-pox and tonsillitis are numerous.

Miss Watson of the Child Labor Committee testified to the following case of a child suffering from scarlet fever engaged in home work:

“I have seen a girl in the desquamating stage of scarlet fever (when her throat was so bad that she could not speak above a whisper) tying ostrich feathers in the Italian district. These feathers were being made for one of the biggest feather factories in the lower part of the city. She told me herself she had been sick with scarlet fever for ten days, but had been upstairs in a neighbor's room working for over a week. The condition of the skin on her hands was such as to attract my attention and be recognized at once as scarlet fever, although she further authenticated it by telling me the doctor stated she had scarlet fever.”

Unfortunately the law does not adequately guard against this, presumably because the diseases are not reported to the Board of Health or to the Labor Department as promptly as they should be, and in some cases are not reported at all.

Men, women and children suffering with tuberculosis and attending tuberculosis clinics were found picking nuts and working on feathers and dolls' clothes. In one family three members were attending the dispensary for treatment, all suffering from tuberculosis. All were working at picking nuts. In another case, a child eight years of age, sent home from school because of active tuberculosis, was later found working at willow plumes in a room lighted by gas in the daytime.

2. EMPLOYMENT OF YOUNG CHILDREN.—The employment of young children in such manufacturing constitutes a most serious menace to the entire community. Articles given out by a manufacturer or contractor are either completely or partially manufactured in the dwelling rooms, and in that manufacture the labor of children of any age may be and is utilized. This situation presents a child labor problem far-reaching in its importance, which as yet has received no legislative recognition.

While the laws of this State prohibit, for example, a manufacturer of willow plumes from employing in his factory children less than fourteen and in some cases, sixteen years of age, there is nothing in the law to prevent the manufacturer from sending his willow plumes to some family living in a tenement house in the same city, to be made up by the adult members of the family and by children anywhere from three to fourteen years of age. This is being done, and such facts were presented to the Commission.

The numbers and ages of the children, some of them incredibly young, found picking nuts, making brushes, and dolls' clothes, together with photographs taken by the Consumers' League and the National Child Labor Committee, are set forth in Appendix 7.

In the report of the Commissioner of Labor for the year 1911, which has just been issued, the Commissioner says:

“It is said that the evils of child labor prevail in connection with tenement house manufacture to an alarming degree. The number of children of school age found at work in their homes during school hours by our inspectors was quite small, but this fact should not be regarded as proof that the alleged growth of child labor in tenements is unfounded. It is probably quite true that many small children under school age are required or permitted to perform certain simple and easy tasks in connection with the various processes and operations incident to the work done in these homes. The work done by such small children cannot be very difficult nor can it be very heavy, but if the little ones are compelled to remain at work for long periods of time, an intolerable condition is brought about, and no effort should be spared to relieve their sufferings. As to the children of school age, it would be well if they were not permitted to engage in any manufacturing pursuit in their homes until

they had reached twelve years of age. But in dealing with this phase of the subject, great care should be exercised so as not to foster wilfulness and disobedience to parents. The sacred right of parents to order the conduct of their offspring and to teach them habits of industry and thrift should not be lightly invaded. Indeed, it should not be thought of except where the welfare of society demands that such a course be pursued. No legislation based upon any theory of regulation or prohibition, however plausible, should be enacted until the subject has been very carefully considered and the true state of facts ascertained."

This Commission agrees that no legislation should be enacted until the subject has been very carefully considered and the true state of facts ascertained. The Commission does not believe that the sacred right of parents to order the conduct of their offspring is such that it permits them to require of their very young children incessant toil for long hours to the injury of their health and the prevention of their receiving sufficient education. Parents must support the child until it has strength and health enough to work for itself. The Legislature has said that no child may work before it is at least fourteen years of age outside of the home. It is essential, therefore, that the home should not be utilized as an annex of the factory, and that the manufacturer should be prohibited from using the tenement home for that purpose.

3. EFFECT ON SCHOOL ATTENDANCE.—A study made in one section of the city of New York of the average school attendance of a hundred children doing home work, disclosed an absence of twenty-nine and a half days per child out of an eighty-nine days' term. Children four years of age and upwards were found working after school hours, during meal hours and on Saturdays. The school work suffers and is neglected, and the education of the child seriously interfered with. In one case, a child eight years of age was reported for the defective class because she slept in the classroom in the morning. Investigation showed that the child was obliged to sew buttons on knee pants, and had to do a certain amount of work at home, irrespective of the time it took, so that every morning the child came to school in an exhausted condition.

"There was nothing wrong with the child; she was not defective, simply tired."

Incidents were related of children from 7 to 14 years of age, some born in this country, others here for several years, who worked at home and had never attended school. In some cases their very existence was unknown to the rest of the children in the house, because they never came out to play.

**4. LOW WAGES OF THE HOME WORKER.**—The tenement industry is without standards of any kind, and is essentially parasitic in its nature. The wage received represents the total earning of the family group, the mother (in some cases, the father, also) and the children. In nut picking, for example, the average day's work will net about forty cents for the family, which means at least five hours work a day for from five to six people. The highest wage was \$12.00 a week for operating on dolls' clothes earned by the combined labors of the father, mother and three children from eight to twelve years of age, the children working after school hours and on Saturday.

The competition between the home workers themselves and between the home workers and factory hands reduces wages to a minimum. In some industries when work in the factory is slack, employees are laid off and put on part time, yet large amounts of work are given out to the home workers. In the manufacture of brushes, practically the entire article is made up in the home, only a small group of workers being employed in the factory to put the materials in shape for the jobber.

**5. COST OF HOME WORK TO THE COMMUNITY.**—By home work or tenement work is meant any kind of manufacturing done for a manufacturer, contractor or agent by persons not working on the premises or under supervision, the wages and rates of payment for these workers being fixed by the persons giving out the work. In its essence home work as thus defined is beyond control by law. In this State we have a Labor Code, certain sections of which expressly regulate conditions under which manufacturing may be carried on, but by giving out home work a manufacturer is actually able to evade his responsibility for complying with any of

these provisions. His work may be done in unclean, unsanitary surroundings. It may be performed by little children or minors working long hours after 5 P. M. when the law frees the girl and boy workers in the factories, or by young girls working far into the night. Home work means unregulated manufacturing carried on beyond the possibility of control as to hours of women's work, child labor, night work of minors or cleanliness and sanitation of work places. From the point of view of the community, the greatest objection to home work is its essential lawlessness.

The cost to the community under the present system, in life and health of the little army of young children and mothers employed in this branch of industry, is entirely too great to justify its existence. In 1888 a special committee was appointed by the House of Lords to inquire into the sweating system at the East End of London. The disclosure of the Lord's Committee on the sweating system showed, among other things, that so far from being socially economic or useful, each industry carried on in the workers' miserable homes was really dragging back that industry as a whole. It was competing unfairly with those carrying on business under the factory law. We have failed to profit in any way by England's experience.

#### NECESSITY FOR EXTENSIVE INVESTIGATION.

The many witnesses who have appeared have urged the restriction of manufacturing in tenement houses, or its complete prohibition. At the same time, as preliminary to any legislation on the subject, they without exception urged and set forth the necessity for a thorough and painstaking investigation so that all of the facts could be gathered.

The difficulties of comprehensive remedial legislation on this subject, practical and legal, are very great. The Commission has found that a great deal of home work is due to the pressure of poverty, to the fact that the family budget is small, not because the father is lazy, but because his whole wage is not sufficient to carry him through the dull season of his industry. The constitutional difficulties are grave. The decision in the Jacobs case, although it may perhaps be explained away or its effect overcome, shows the necessity for a complete and thorough investigation and

presentation of the facts before any radical legislation is attempted. The Commission has set forth particularly the results of its investigation in order to show the pressing necessity for a continuance of the investigation of this important subject,— a necessity that is felt by all who have appeared before the Commission.

## EMPLOYMENT OF WOMEN IN MANUFACTURING ESTABLISHMENTS

### NUMBER AND IMPORTANCE OF WOMEN WORKERS IN THE STATE

The preliminary report of the United States Census for 1910 showed that there were 293,637 women employed in manufacturing establishments in the State of New York, 30 per cent of all its wage earners. The Census Report for 1905 showed the average earnings of women in all industries in this State was \$6.54 per week. The only industries (except some minor industries employing less than 1,000 workers) in which women are not employed, are in the manufacture of bricks, tiles, fertilizers and ice. The average time a woman remains in a factory is about seven years, the majority of women leaving after a few years to marry. The State is therefore interested not only in the welfare of women as workers, but has a deeper concern in seeing that while adding economic wealth to the State they work under such proper conditions as will not impair their health and vitality as mothers.

In its investigation, the Commission has made a study of conditions in six of the trades in which over 60 per cent of the employees are women, namely, artificial feathers and flowers, waists, paper boxes, textiles and men's clothing. Nine hundred and eleven different workshops employing 20,359 women were inspected. The results of this investigation are fully set forth in Appendix IV hereto annexed. In addition, the investigations conducted for the Commission by Miss Goldmark cover industries in which over 2,000 women were employed.

### CHARACTER OF THE WORK DONE BY WOMEN.

A great deal of hard and physically exhausting work is still done by women employed in factories. Reference is hereafter made to women working in the core rooms of foundries. In a meat packing plant in Buffalo a number of women were employed in the trimming and sausage rooms, working side by side with men who set the pace for the work. The women stood all

day at their work on floors covered with water and slime, most of them wearing heavy rubber boots. Women were found employed in industries where industrial poisons were used or generated in the process of manufacture. The entire subject of the prohibition, or at any rate, the close supervision of the employment of women in dangerous trades and occupations, or in those involving hard manual labor, requires most careful consideration.

The continual standing of women in factories and manufacturing establishments is one of the worst and most dangerous features of a large part of their work. Women are required to stand in candy factories, laundries, textile mills and printing shops for hours at a time, often for the entire day.

The effects of continual standing upon women are very grave. Dr. George W. Goler, the health officer of the city of Rochester testified:

"I think that if we could make a study of the varicose veins upon the legs and feet of women who stand, we would be perfectly surprised at the conditions we find. I have photographs of the feet and legs of women who stand, and the great tortuous varicose veins upon those legs would make one expend as much pity on those women as upon a horse that we see whipped on the street. You know we expend a vast amount of pity on dumb animals that are treated as they ought not to be; we have only recently waked up to the fact that we ought to expend some pity and sympathy upon our own kind."

Much of this standing is quite unnecessary. Many more processes could easily be adapted to a sitting posture. Sec. 17 of the Labor Law, hidden away between a provision relating to the illegal use of labels and one dealing with scaffolding for the use of employees, regulates the use of seats for women in factories, and provides as follows:

Sec. 17. "Every person employing females in a factory, or as waitresses in a hotel or restaurant, shall provide and maintain suitable seats for the use of such female employees and permit the use thereof by such employees to such an extent as may be reasonable for the preservation of their health."



The law is vague and indefinite, and in actual practice is very unsatisfactory. In a great many of the establishments no seats whatsoever are provided. Where they are furnished, the work that the women have to perform does not permit of their use.

The Commission therefore recommends the amendment of sec. 17 as follows:

*"Every person employing females in a factory or as waitresses in a hotel or restaurant shall provide and maintain suitable seats with backs at an angle of not less than 100 degrees for the use of such female employees, and permit the use thereof by such employees to such an extent as may be reasonable for the preservation of their health. Wherever practicable and where processes are adapted to a sitting posture, suitable seats with backs at an angle of not less than 100 degrees shall be supplied for all female employees."*

#### HOURS OF LABOR.

In structure and in function, women are differentiated from men. A woman's body is unable to withstand strain, fatigue and privations as well as a man's. The nervous strain resulting from monotonous work and speeding up, intensified by the piece-work system, when coupled with excessive length of working hours, can only result in undermining the whole physical structure of the woman, lowering her vitality and rendering her easily susceptible to the diseases that find their prey among factory workers. Newer and faster machines are being continually introduced. In the knitting mills of Utica, some of the machines make as many as 3,500 stitches a minute. In the paper-box trade, girls fill in 2,000 boxes a day, involving over 4,000 heavy pressures with the foot. The manufacturer's desire for speed takes no account of the strain upon the woman worker caused by the long hours and monotonous and nerve-racking work that results in destroying the health of the women and rendering them unfit to perform their functions as mothers.

The first step, therefore, in the right direction, is to ~~decrease~~ the length of the working day for women. In his last message to the Legislature, Governor Dix recommended the reduction of the hours of labor for women. The necessity for a shorter working

day for the women factory workers has been upheld by all of the witnesses called, professional and laymen. The Commission is not prepared to maintain that at the outset full productivity will be as great in nine hours a day as in ten, but as has been admirably stated by Prof. Irving Fisher in his report on National Vitality:

“The point to be insisted upon is not that it is profitable for an employer to make the working-day shorter, for often it is not, but to show that it is profitable for the nation and race. Continual fatigue is inimical to national vitality, and however it may affect the economic profits of the individual, it will in the end deplete the vital resources on which national efficiency depends.”

The Legislature has already given indication of its desire to properly regulate the hours of labor for its women workers. The Labor Law provides that no female less than 21 years of age, and no woman shall be employed or permitted to work in any factory before 6 A. M. or after 9 P. M. nor for more than 6 days or 60 hours in any one week, nor for more than 10 hours in any one day, except that in order to provide for either a Saturday half holiday or whole holiday, the 60 hours of work may be performed in 5 days. It also provides for irregular overtime not to exceed 3 days a week, provided that no work is performed for more than 12 hours in any one day or 60 hours a week.

The Court of Appeals, however, in the case of *People v. Williams* (reported in 189 *New York*, page 131), found that portion of the statute unconstitutional which provided for a closing time and which, as the Court stated, prevented a woman, however willing, “from engaging herself in a lawful employment during the specified periods of the 24 hours.” Judge GRAY, writing the opinion says, however:

“I find nothing in the language of the section which suggests the purpose of promoting health, except as it might be inferred that for a woman to work during the forbidden hours of night would be unhealthful. If the inhibition of the section in question had been framed to prevent the ten hours of work from being performed at night, or to prolong

them beyond nine o'clock in the evening, it might more readily be appreciated that the health of women was a matter of legislative concern. That is not the effect, nor the sense, of the provision of the section with which alone we are dealing."

#### OVERTIME.

The evil effects of overtime can readily be appreciated by what has already been said. The human organism, particularly the organism of a woman, may normally be taxed to a certain point. That point is undoubtedly reached at the end of a regular day's work. Beyond that, any burden can result only in fatigue, over-exertion and consequent impairment of health. Alternating periods of intense overwork and then of idleness constitute a menace to the physical and moral life of women workers.

#### THE DIFFICULTY OF ENFORCING THE LAW RELATING TO WOMEN.

The present 60-hour law is not enforced and cannot be enforced because of the complicated and indefinite provisions relating to overtime, and the absence of a specified closing hour. To enact legislation limiting the hours of work without including a provision for a closing time will simply add another unenforceable provision to the laws of this State. The Commission believes that a statute can be so drawn, and such facts presented to the Court of Appeals, as to provide legally that no woman may be employed in a factory building after a certain hour. Such provisions are contained in the laws of European countries, and experience shows that only in that way can any provision regulating the hours of employment be enforced.

#### LAWS IN FOREIGN COUNTRIES.

In European countries, the subject of the employment of women has received careful consideration. The hours of labor are carefully regulated, and the closing time definitely stated. The laws of Great Britain, Germany, France and Holland relating to the employment of women in manufacturing establishments are typical.

## GREAT BRITAIN.

*Hours — Textile Factories* (Sec. 24, Laws of 1901, 1 Edw. VII, Chap. 22).

The period of employment, except on Saturday, shall either begin at 6 A. M. and end at 6 P. M., or begin at 7 A. M. and end at 7 P. M.

There shall be allowed for meals during said period of employment on every day except Saturday not less than two hours, of which one hour at the least shall be before 3 P. M.

Special regulations for a shorter day on Saturday.

## FRANCE.

The maximum length of the working day shall be ten hours, broken by at least one hour of rest.

Overtime may be granted by departmental decrees for two hours in one day, during not more than sixty days in the year for certain trades, chiefly season trades. By departmental decrees, employment of women may be prohibited or regulated in trades considered dangerous to health or morals.

## HOLLAND.

By royal decree employment of women may be prohibited or regulated in trades held dangerous to health.

## GERMANY.

Working women may not be employed between 8 o'clock in the evening to 6 o'clock in the morning, and on Saturdays and the eve of holidays not after 5 o'clock in the afternoon.

The employment of working women may not exceed the duration of ten hours daily, and eight hours on the eve of Sundays and holidays.

Between working hours at least one hour of noon rest must be allowed to working women.

After the end of the daily working time, a continuous rest of at least eleven hours must be allowed to working women.

Working women who have to attend to a household must, at their request, be dismissed half an hour before the noonday rest, unless this lasts at least one hour and a half.

Overtime may be granted by the lower administrative authority for not more than twelve hours of labor in one day, during two weeks, not more than forty days in the year, but there must be an unbroken interval of ten hours between one day's work and the next.

For a period exceeding two weeks, the same permission may be granted only by the higher administrative authority, but not to exceed fifty days in the year.

This Commission is convinced that unless there is in the law some valid provision fixing a closing time, the law cannot be properly enforced. The difficulty is very apparent. The worker through fear of losing her employment, will rarely complain. It is useless, therefore, to look to her for active assistance. This principle has been applied successfully in this State in the case of children between the ages of 14 and 16. There is no valid reason why the same principle should not be extended to the women workers in the factory who play so important a part in the State's industrial prosperity. The interests of the State imperatively demand that its women workers be effectively protected.

The Commission is of the opinion that the hours of labor for women should be shortened, but at the present time it refrains from making any specific recommendation upon the subject.

#### THE EMPLOYMENT OF WOMEN BEFORE AND AFTER CHILDBIRTH.

The Commission heard testimony to the effect that women are employed in manufacturing establishments of the State, sometimes at hard manual labor, immediately before and after childbirth. That this condition is a source of danger not only to the women but to their offspring is not open to argument. It is a matter of common knowledge that women who have to deny themselves rest and care during the last few weeks of pregnancy, and the first few weeks after confinement, are very liable to suffer from hemorrhage and chronic uterine diseases.

Premature births are not infrequent results of overwork. The relation of infant mortality to the employment of women immedi-

ately before and after childbirth illustrates the importance of this matter. Investigation by Sir John Simon and his colleagues into sanitary conditions in England between 1859 and 1865, showed that in proportion as adult women were taking part in factory labor, the mortality of their infants rapidly increased. Over half a century has elapsed since Sir John Simon declared that infants perish under the neglect and mismanagement caused by their mother's occupation, yet we have taken no steps to remedy that evil which results so disastrously to the State.

In European countries the matter is covered by statute, women being prohibited from working in factories within a certain period before and after they give birth to children. The English law prohibits the employment of women within four weeks after childbirth. In this country the Massachusetts law contains a similar prohibition. There may be difficulty in enforcing such provisions, but the State should in its statutes emphatically protest against this deplorable waste and neglect of infant life.

#### RECOMMENDATION.

The Commission at this time recommends the addition of the following section to the Labor Law of the State:

*Sec. 93 (a). Prohibition of employment of females after childbirth.* No owner, proprietor, manager, foreman or other competent authority of any factory, mercantile establishment, mill, or workshop shall knowingly employ a female or allow a female to be employed therein within four weeks after she has given birth to a child.

Further consideration and study may result in the recommendation of a provision that can be more readily enforced, but the Commission believes that this provision is a step in the right direction, and should be taken at once.

## CHILD LABOR

### EXTENT OF CHILD LABOR IN NEW YORK STATE.

In the State of New York, in 1911, there were 13,083 children under the age of sixteen found actually working in factories and manufacturing establishments. The last available statistics showed that the average weekly wage of all children in the State was \$3.64 (*U. S. Census Report, 1905*). At public hearings held in the different cities, a large amount of testimony was received concerning the conditions under which children are employed. Manufacturers, representatives of organizations interested in the welfare of the children, and some of the children themselves were examined.

Under the present law, no child under the age of 14 is permitted to work in or in connection with any factory in this State. No child between the age of 14 and 16 years is permitted to be so employed unless an employment certificate is obtained and filed in the office of the employer at the place of employment of such child. This certificate is granted, generally speaking, if the child satisfies three requirements as to age, physical condition and education.

### PHYSICAL SUPERVISION OF WORKING CHILDREN.

Only in doubtful cases is the physical fitness of the child under 16 years of age determined by a medical officer of the Board or Department of Health. [Sec. 71 (e) of the Labor Law.]

There is no standard of physical fitness prescribed by the law. The New York City Board of Health has adopted a standard of 80 pounds in weight and 58 inches in height, yet local boards of health in other cities of the State may adopt any other standard. Health officers, physicians and representatives of child labor committees who have appeared before the Commission stated emphatically that the present system of physical examination before the issuance of an employment certificate is superficial and entirely inadequate. The following table shows the number of employment certificates issued by the Board of Health of the City of New York within the past five years, together with the number refused because of physical unfitness.

<i>Year</i>	<i>Certificates</i>	
	<i>Issued.</i>	<i>Refused Because of Phys- ical Unfitness.</i>
1906	21,220	5
1907	23,013	4
1908	23,932	111
1909	29,343	291
1910	56,351	501

The improvement respecting the employment of the physically unfit is marked, but is not nearly what it should be.

A thorough physical examination of every child should be made before the working certificate is issued, so as to prevent the employment of those physically unfit. In addition a periodical physical examination of all minors in factories until they attain the age of at least 18 years should be required. Coupled with this supervision, either the local Health Department, or the Division of Medical Inspection of the State Department of Labor, or the one under the supervision of the other, should be given the power to dismiss any minor from an employment deemed injurious to the minor's health. This power is conferred on inspectors by the laws of England and Massachusetts. Our statute sets forth merely a number of occupations deemed injurious in which the employment of children is prohibited. This list is inadequate. It fails to cover a great many dangerous occupations, and overlooks the fact that there may be processes or methods of manufacturing in a given industry which are so injurious to the health of minors as to justify their exclusion therefrom. It loses sight of the fact that an employment which may be carried on with impunity by a child of strong physique may mean death to many others. All of the numerous witnesses who have appeared before the Commission, professional and laymen, have testified to the advisability of having such continued medical supervision. Some have said that while advisable, it was impracticable. Of course, it would be a financial cost, but the Commission cannot emphasize too strongly the fact that this cost



would be insignificant compared with the benefits that would accrue.

The child is supervised by the State in the public school until he attains the age of at least 14 years. Surely the need of medical supervision is greater during the next few years when these young boys and girls become workers and develop into manhood and womanhood. That efficiency means physical vigor unimpaired hardly requires demonstration.

Specific recommendations for the regular physical examination of all children employed in manufacturing establishments cannot be made until the Labor Department is provided with a sufficient number of medical inspectors for that purpose.

#### CONTINUATION SCHOOLS.

The present law prescribes in substance that the child must be able to read and write simple sentences in the English language, must have received some instruction in reading, spelling, writing, English grammar and geography, and must be familiar with the elementary operations of arithmetic up to and including fractions.

That means in the New York city schools that the child has reached the 5-B grade. The child entering school at the age of 7 will reach that grade when about 12½ years old. We require, therefore, for 14-year old children the standard ordinarily attained at 12½ years of age. The question of the advisability of raising this educational requirement should receive careful consideration.

Under our present economic system, children often begin their life of toil at an early age, but this evil certainly does not lessen the obligation of the State to provide for their education. Modern factory conditions undoubtedly deaden in the great majority of cases whatever intellectual interest the child may have. It is for these young workers that we must plan, and provide with even greater care than for those who are fortunate enough to continue at school.

So far as child workers are concerned, the elementary evening schools are a failure. The child after a long day's toil is too tired for mental work in the evening, which should instead be devoted to exercise and recreation. Wm. H. Maxwell, the Superintendent of Schools of the City of New York, in his current report, states:

"After observing and studying these schools for thirty years, I am now convinced that the attempt to give instruction in the ordinary elementary branches in the evening to boys and girls from fourteen to sixteen years of age is a gigantic blunder."

Yet for this most unsuccessful branch of public education over \$400,000 is annually expended in the city of New York.

That some further education of the child is necessary after he enters the factory can hardly be doubted. In Germany and other European countries the problem has been successfully solved by a system of continuation schools. All apprentices from 14 to 16 years of age are compelled to attend such schools for a certain number of hours a week during a portion of the year. Employers are obliged to allow their young employees a definite amount of time each week during which they may attend these schools.

There seems to be no reason why this method of continuing the education of young workers cannot be successfully adopted in this State. In the report already referred to, the City Superintendent of Schools of the City of New York says:.

"I recommend, therefore, that in lieu of the evening elementary schools, a system of continuation schools from 7 to 9 A. M., and from 4 to 6 P. M. be organized; that legislation be sought to require employers to give each employee under 19 years of age four hours a week for forty weeks each year, and to constrain young people between these ages to attend such schools regularly. These schools would become true continuation schools; that is, they would continue under favorable conditions the education, even while the boy or girl is at work, which was broken off at any year below the 19th."

Such continuation schools would, generally speaking, instruct the child, first, in a trade or vocation; second, in the language and literature of this country; third, in civics and history. These schools would improve the worker physically, mentally, morally and financially; would better the conditions of labor in the work-room, in the home and in civic life; and would raise the character of the industries.

The present school buildings can readily be utilized for this purpose, and the increased expense would be very little compared with the results achieved. This subject is one which in the opinion of the Commission merits most careful consideration and investigation.

#### HOURS OF LABOR.

For children between 14 and 16 years of age employed in factories and manufacturing establishments the State has a model law. Section 77, subdivision 1 of the Labor Law provides as follows:

No child under the age of 16 years shall be employed or permitted to work in or in connection with any factory in this State before 8 o'clock in the morning, or after 5 o'clock in the evening of any day, or for more than 8 hours in any one day, or more than 6 days in any one week.

The law is clear, definite, and what is of most importance, it is enforceable because of the closing hour therein prescribed. When we come to the law governing the employment of children over 16 years of age, we are confronted by a very troublesome situation. The law governing their employment is set forth in Section 77, subdivisions 2 and 3, and Section 78, subdivision 1, of the Labor Law.

These sections provide in substance that no male minor under 18 shall be employed more than 6 days or 60 hours in any one week or for more than 10 hours in any one day, and that no female under 21 years shall be employed before 6 or after 9 o'clock in the evening, or more than 10 hours a day or 60 hours a week. But females over 16 and males between 16 and 18 may be employed more than 10 hours a day either regularly in order to make a short day or holiday on one of the six working days, or irregularly not more than three days a week, as long as they do not work more than 12 hours a day or 60 hours a week.

These laws are indefinite and inadequate. They are unenforceable because they do not fix a definite closing time, they permit overtime that is destructive to health, and in the case of males between 16 and 18 years of age and female minors they should undoubtedly be changed. Just what changes in the law should be made can be determined only after a careful study of conditions.

The decision in the case of *People vs. Williams* by the Court of Appeals to the effect that a closing time for adult women is unconstitutional does not, of course, apply to minors.

#### RECOMMENDATIONS.

The Commission recommends the amendment of the Labor Law to provide for a thorough physical examination of the child by a medical officer of the Department or Board of Health before a certificate is issued, and for the transmission of duplicate records of the result of such physical examination to the Department of Labor.

Sec. 71 (e) should be amended by omitting at the end thereof the following:

In doubtful cases such physical fitness shall be determined by a medical officer of the Board or Department of Health. Every such employment certificate shall be signed in the presence of the officer issuing the same by the child in whose name it is issued.

In place thereof, the following provision should be substituted:

*"In every case, before an employment certificate is issued, such physical fitness shall be determined by a medical officer of the Board or Department of Health who shall make a thorough physical examination of the child, and record the result of such examination on a blank furnished for that purpose by the State Department of Labor, and shall set forth thereon such facts concerning the physical condition and history of the child as the Commissioner of Labor may require."*

Section 75 of the Labor Law should be amended to read as follows:

*"The Board or Department of Health or Health Commissioner of a city, village or town, shall transmit between the first and tenth day of each month, to the office of the Commissioner of Labor, a list of the names of the children to whom certificates have been issued together with a duplicate of the record of the physical examination of all such children made as hereinbefore provided."*

## FOUNDRIES

### GENERAL CONDITIONS.

The sanitary conditions in the brass, iron and steel foundries of the State were found to be very poor. The occupation is an arduous one, and the workers during the day are exposed to marked changes in temperature. The washing facilities are bad. The system of ventilation in many of the foundries is entirely inadequate. The result is shown by the number of moulders suffering from rheumatism, pulmonary diseases and kidney trouble. In many of the foundries there is no system of forced ventilation to remove the core gas. These fumes and the heavy dust from castings cleaned in the workrooms are inhaled by the workers, and render them more or less susceptible to all forms of respiratory diseases.

### EMPLOYMENT OF WOMEN IN FOUNDRIES.

Women were found employed in foundries in Syracuse and Buffalo. They work under exactly the same condition and with the same surroundings as the men. They are subjected to the fumes of gas and to the smoke. This work means severe manual labor, and altogether the occupation seems to be a most dangerous one for a woman in so far as her health is concerned.

A majority of these women seem to be of foreign birth, although there are some who are natives of this country. The wages received by them are small, between \$4 and \$8 a week, while men doing similar work receive about \$3 a day.

The Commission is of the opinion that the employment of women in work of this kind in foundries in the State should be prohibited. Their employment in that industry is not only a great injury to themselves, but it is a menace to posterity, and should not be tolerated by any civilized community.

The Commission, however, at this time is not prepared to recommend any legislation upon this subject because, in the short time at its disposal, it has not had sufficient opportunity to gather all the necessary facts in connection with such employment.

## ACCIDENTS IN FOUNDRIES.

Accidents in foundries are numerous. They are caused mainly by two conditions:

1. By the narrow and often obstructed passageways or gangways which, during casting time, are an especial element of danger.

2. By defective ladles, tongs, chains and other lifting devices.

There is room for material improvement in the conditions in foundries from the point of view of both sanitation and safety. That many of the insanitary conditions in the foundries to-day are due to the unenforcement of the existing law, is clearly shown by a letter addressed to the Commission by a local secretary of the Moulders' Union, after a public hearing held by the Commission. In that letter the secretary of the Union says:

"The factory inspector for this district has given the foundries thirty days' notice to clean up and put them in sanitary condition. This is being complied with by the foundries. The walls and ceilings are being whitewashed, new closets are being installed, glass is being put in the windows, and a general cleaning-up is going on. One foundry cleaned its roof beams of seventeen years' accumulation of dust. The brass foundries are placing hoods over the furnaces carrying off a large part of the fumes of coppers, etc. The local health authorities are also co-operating with us to a large extent in the general house cleaning."

## RECOMMENDATIONS.

It is quite clear, however, that the existing laws upon this subject are inadequate. An amendment to the Labor Law has been proposed by the Moulders' Union of the State of New York which seeks to remedy some of these evils.

The Commission has carefully considered the provisions of this bill, and believes that its passage would be of great benefit to those employed in foundries.

This bill requires the addition of a new section to the Labor Law, section 97, and provides that all entrances to foundries

shall be constructed so as to minimize drafts; windows shall be kept in repair, passageways in foundries shall be of such width as to make them reasonably safe, and shall not be obstructed during casting time. Smoke, steam and gases shall be removed, exhaust fans being supplied where necessary for this purpose.

The cleaning of castings is not to be done in rooms where other work is going on. Foundries shall be properly and thoroughly lighted, and in cold weather sufficiently heated. All foundries employing more than five moulders shall provide suitable washrooms and washing facilities and lockers for clothes. All apparatus for transporting molten metal, and all machines shall be maintained in proper condition and repair, and a sufficient supply of lime water, olive oil, vaseline, etc., shall be kept on hand in the event of accidents.

The Commission recommends the passage of this amendment to the Labor Law. Its enactment would do much to improve the conditions and prevent accidents in the foundries of the State, and also will tend to lessen the diseases with which many of those working in foundries now suffer.

The Commission recommends, therefore, the addition of a new section to the Labor Law, to be known as section 97, as follows:

Sec. 97. Brass, Iron and Steel Foundries.—1. All entrances to foundries shall be so constructed and maintained as to minimize drafts, and all windows therein shall be maintained in proper condition and repair.

2. All passageways in foundries shall be constructed and maintained of sufficient width to make the use thereof by employees reasonably safe; during the progress of casting such passageways shall not be obstructed in any manner.

3. Smoke, steam and gases generated in foundries shall be promptly and effectively removed therefrom, and whenever it is necessary, exhaust fans of sufficient capacity and power, properly equipped with piping and hoods, shall be provided and operated to remove such smoke, steam and gases. The milling and cleaning of castings shall be done in rooms not otherwise used during the progress of such milling or cleaning, and provision shall be made for confining and collecting the dust arising during the process.

4. All foundries shall be properly and thoroughly lighted during working hours, and in cold weather proper and sufficient heat shall be provided and maintained therein. (The use of heaters discharging smoke or gas into workrooms is prohibited.) In every foundry employing five or more moulders there shall be provided and maintained for the use of employees therein, suitable and convenient washrooms adequately equipped with proper hot and cold water service; such washrooms shall be kept clean and sanitary and shall be properly heated during cold weather. Lockers shall be provided for the safe-keeping of employees' clothing, and proper facilities shall be provided for drying the working clothes of employees. Water-closets used by foundry employees shall be so arranged or located that such employees in passing thereto or therefrom shall not be exposed to outdoor atmosphere, and such water-closets shall be properly heated during cold weather.

5. The flasks, moulding machines, ladles, cranes and apparatus for transporting molten metal in foundries, shall be maintained in proper condition and repair, and any such tools or implements that are defective shall not be used until properly repaired. There shall be in every foundry, available for immediate use, an ample supply of lime-water, olive oil, vaseline, bandages and absorbent cotton, to meet the needs of workmen in case of burns or other accidents; any other equally efficacious remedy for burns may be substituted for those herein prescribed.

#### CONCLUSION.

Within the few months at the Commission's disposal, it has done as much as has been possible. Much longer time and greater resources are needed to do justice to the subjects under investigation.

A comprehensive system of legislation should be devised, as has been indicated, and this will require not only careful thought and study, but the examination of existing systems in this and other countries. That there should be more adequate protection and supervision of the workingman and the conditions under which manufacturing is carried on is amply demonstrated.

While the present laws should be enforced, and means should be provided for their proper enforcement, yet it is felt that many



of them are inadequate and should be carefully revised, to the end that life may be preserved and lengthened, that social conditions may be bettered, and that the State and the Nation may gain in economic wealth and industrial prosperity.

Under the provision requiring the Commission to recommend legislation which will promote the best interests of the community, the Commission has been urged by the Fifth Avenue Association, the League of American Architects and other associations and individuals, to recommend legislation which will tend to beautify Fifth Avenue and the streets adjacent thereto, and to remedy conditions resulting from the large number of manufacturing establishments now being located in that vicinity. At this time the Commission is unable to make such recommendations.

This report is respectfully submitted.

ROBERT F. WAGNER, *Chairman*,  
ALFRED E. SMITH,  
SIMON BRENTANO,  
SAMUEL GOMPERS,  
CHARLES M. HAMILTON,  
EDWARD H. JACKSON,  
ROBERT E. DOWLING,  
MARY E. DREIER,  
CYRUS W. PHILLIPS,

*Commission.*

ABRAM I. ELKUS,  
BERNARD L. SHIENTAG,  
*Counsel.*



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## **APPENDIX I**

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# **PRELIMINARY GENERAL REPORT**

OF THE

# **DIRECTOR OF INVESTIGATION**

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NEW YORK, Jan. 27th, 1912.

HON. ROBERT F. WAGNER, *Chairman*

*New York State Factory Investigating Commission,  
New York City.*

DEAR SIR:

I herewith beg to submit the reports of the sanitary investigation of "existing conditions under which manufacture is carried on in the cities of the first and second class in the State, as to matters affecting the health and safety of operatives."

The investigations have been made under my direction, pursuant to a resolution adopted by your Commission, September 11th, 1911.

The reports submitted herewith, are as follows:

- (1) A Preliminary General Report of the Investigation.
- (2) A Special Report on the Inspection of Five Hundred Bakeries and the Physical Examination of Eight Hundred Bakers in New York City.
- (3) Notes on Several Trades Employing a Large Proportion of Women.
- (4) A Preliminary Report on One Hundred Cases of Lead Poisoning in New York City, with an Appendix on Arsenical Poisoning.
- (5) Notes of an Industrial Survey of a Selected Area in New York City, with respect to Sanitary Conditions in the Factories.
- (6) A Memorandum on the Extent of Child and Home Labor.

Several additional reports on the Chemical Trades, Printing Industry, Tobacco Trades, and several other trades, will be submitted later.

Respectfully submitted,

G. M. PRICE, M. D.,  
*Director of Investigation.*



## PRELIMINARY GENERAL REPORT OF THE DIRECTOR OF INVESTIGATION

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### THE SCOPE, ORGANIZATION AND WORK OF THE INVESTIGATION.

#### 1. THE FIRST OF ITS KIND IN THIS COUNTRY:

The investigation into the "existing conditions under which manufacture is carried on as to matters affecting the health and safety of operatives, to the end that such remedial legislation be enacted as will eliminate existing peril to the life and health of operatives," is the first general investigation that has been made by any legislature in this country. There have been several legislative investigations of special industrial conditions, such as the Illinois investigation into "Occupational Diseases," the Massachusetts Commission on "Factory Inspection," the Massachusetts and Connecticut investigations into "Minimum Wage," and a number of investigations of "Industrial Accidents and Compensation Insurance Laws."

It is appropriate that the Empire State, with its forty-five thousand industrial establishments, and over one million employees, containing nearly 20 per cent of all the industrial establishments, and one-sixth of the industrial population in the United States, should be the pioneer in the great movement of industrial investigation and betterment.

#### 2. SCOPE OF INVESTIGATION:

The scope of an investigation into "matters affecting the health and safety of operatives" is necessarily a very broad one, embracing, as it does, the whole range of the various factors and conditions affecting the health, life and welfare of the working

people. Of these various factors of industrial life we need mention but the following:

1. Age, Sex, Personal Habits, Education, etc., of the workers.
2. The Work-place and Working Conditions, such as: Fire Protection, Light, Illumination, Ventilation, Temperature, Humidity, Sanitary Care, Comforts, Cleanliness, Hours of Labor, Wages, etc.
3. Working Materials and Processes, such as: Dusts, Poison, Gases, Fumes, Machinery, Infective Material and other dangerous elements.

### 3. THE EXTENT OF THE FIELD OF INVESTIGATION:

The extent of the field of industrial investigation in the State is as follows:

There are two cities outside of Greater New York in the first class, and six cities in the second class. The number of separate industries tabulated in the United States Census is 168, with 80 supplementary industries, which are embraced under the common heading "all other industries," a total of 248 separate industries. The total number of separate industrial establishments in this State is 44,935, with a total number of wage workers of 1,003,981.

In Greater New York alone there are 31,156 establishments, with a total of 677,885 workers.

The number of separate workshops does not correspond with the number of establishments, for the reason that many establishments have two to ten separate workshops. The number of separate workshops therefore in this State is probably over 150,000.

### 4. LIMITATION OF THE INVESTIGATION:

The scope of the investigation being so broad and the extent of the field so vast, it is self-evident that there was no possibility of making either an extensive investigation of all the factors affecting industrial conditions, or of all the industries or industrial establishments in the State, or of making a very intensive investigation into one or more of the conditions of industrial life.



## 5. RESOURCES AND DURATION OF INVESTIGATION:

The budget allowed for the whole investigation was \$5,500.00, including the salaries of the Director of the Investigation and of the Fire Expert, and of the expenses of the fire protection investigation; leaving the sum of about \$2,600.00 for the work of sanitary investigation.

The work of inspection was organized October 1st, 1911; the actual field work was begun October 9th, and stopped December 1, 1911. Greater attention was paid to New York City, where the investigation was conducted from October 9th to November 15th. The last two weeks in November were devoted to a brief investigation of a very limited number of establishments in the six remaining cities.

## 6. WORK ACCOMPLISHED:

The inquiry was divided into two main divisions: (1) a general sanitary investigation of various industries and industrial establishments, and (2) a special investigation of physical conditions of workers, child labor, lead poisoning, etc.

### I. GENERAL SANITARY INVESTIGATION:

The general sanitary investigation was limited to the industries and establishments, as indicated in Table II, 20\* industries, 1,836 industrial establishments, and 3,001 individual shops having been inspected during the five weeks of work by a staff of eight to ten inspectors.

The industries included in this general sanitary investigation, were as follows:

#### 1. *The "Chemical Trades":*

Ninety-three establishments have been inspected by Inspector Stuart Owens, a graduate chemist, and by Mr. John Vogt, a competent chemist, who was transferred to us by the courtesy of Commissioner John Williams. The branches of the chemical

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\*This does not include industries inspected by the Bureau of Social Research.

TABLE  
MANUFACTURES IN  
CITIES OF THE FIRST

	Greater New York	Buffalo	Rochester	Syracuse
No. of establishments....	25,938	1,752	1,203	739
Capital.....	\$1,364,353,000	\$192,871,000	\$95,708,000	\$51,744,000
Cost of materials used....	1,092,155,000	136,120,000	50,674,000	21,781,000
Salaries and wages.....	445,772,000	38,052,000	29,252,000	13,737,000
Miscellaneous expenses....	266,034,000	20,402,000	14,432,000	5,794,000
Value of products.....	2,029,693,000	218,283,000	112,676,000	49,444,000
Value added by manu- facture.....	937,538,000	82,163,000	62,002,000	27,663,000
<i>Employees:</i>				
No. salaried officials and clerks.....	97,453	8,339	6,467	12,907
Average no. of wage earners.....	554,002	51,393	39,108	18,151

No. 1.

NEW YORK STATE.

AND SECOND CLASS.

Utica	Schenectady	Troy	Albany	Yonkers	Total 1st and 2nd class cities in N. Y. state
317	134	363	395	158	30,999
\$27,796,000	\$51,816,000	\$39,309,000	\$26,276,000	\$58,769,000	\$1,912,632,000
16,646,000	21,952,000	15,626,000	10,521,000	43,202,000	1,408,677,000
7,513,000	13,088,000	11,602,000	6,815,000	8,024,000	837,123,000
3,173,000	2,362,000	4,861,000	3,332,000	3,265,000	323,655,000
31,199,000	38,165,000	37,980,000	22,826,000	59,334,000	2,599,600,000
14,553,000	16,213,000	22,354,000	12,325,000	16,132,000	190,943,000
1,205	2,677	1,777	1,336	885	123,046
13,153	14,931	20,020	9,681	12,711	733,150

trades inspected, varied from the manufacture of commercial acids to the manufacture of drugs, poisons and paints. A special report of this investigation will be presented to the Commission later.

## 2. *Manufacture of Food-Stuffs:*

Six hundred and twenty-six establishments manufacturing various food-stuffs: bread, meat, pickles, ice-cream, sugar, etc., were investigated. A special report on the bakeries is herewith presented.

## 3. *Women's Trades:*

An investigation was made of the following industries, where a large percentage of the employees are women: Artificial flowers and feathers, Laundries, Paper-box Trade, Clothing (women's waists) and Textiles.

A special report on this investigation is herewith presented.

## 4. *The Printing Trades:*

Our inspectors investigated three branches of the printing trades, viz.: Typesetting, Photo Engraving and Lithograph-work. Two hundred and ninety-three establishments, and four hundred and twenty-six separate shops have been inspected. A special report on The Printing Trades will be presented later.

## 5. *Tobacco Trades:*

One hundred and fifty-one inspections of cigar, cigarette and snuff tobacco factories were made, and a special report on this trade will be forthcoming.

*In addition to the above, the following miscellaneous industries have been inspected: Corks, Rag-sorting, Human-hair, Dyeing and Cleaning, etc.*

TABLE No. 2.

WORKERS IN SHOPS AND ESTABLISHMENTS INSPECTED.

INDUSTRY	NEW YORK			OTHER CITIES		
	No. Inspected	No. Estab- lishments inspected	No. Workers	No. Inspected	No. Estab- lishments inspected	No. Workers
Printing .....	410	285	6,474	16	8	175
Tobacco .....	157	100	2,677			
Chemicals .....	217	93	1,739			
<i>Food Stuffs.</i>						
Bread .....	497	416	3,002	2	1	19
Candy .....	142	50	2,771	15	4	140
Ice Cream .....	5	5	50			
Pickles .....	27	6	470			
Spices and drugs .....	35	8	341			
Sugar refineries .....	3	3	3,400			
Mineral waters .....	63	51	443			
Meat packing .....	6	4	87	8	1	900
<i>Women's Trades.</i>						
Artificial flowers .....	120	94	1,891			
Laundries .....	155	90	3,054	48	26	2,873
Paper boxes .....	104	44	2,142	30	9	1,349
Clothing .....	104	70	5,351	95	30	3,000
<i>Miscellaneous.</i>						
Corks .....	22	19	611			
Rags .....	34	9	304	4	1	27
Textiles .....	1	1	23	21	7	640
Human hair .....	131	67	547			
Cleaning and dyeing .....	69	19	929			
Other trades .....	400	200	4,626	51	22	5,444
Total .....	3,001	1,636	41,891	290	109	12,977

## II. SPECIAL INVESTIGATIONS:

1. *Physical Examinations:* A special feature of the investigation was made in the physical examination by our medical staff of 800 bakers in their workshops and during their work. This investigation was accomplished within two weeks by a staff of physicians and with the assistance of the officials of the Baker's Union. This medical examination was made simultaneously with an inspection of the sanitary conditions of 500 bakeries.

At the request of the Furrier's Union, a physical examination has been made of 85 furriers. A detailed account of the results of these examinations is made in a special report.

2. The great interest that was created by the report of the Illinois Occupational Diseases Commission, and by the later federal reports on this subject, has induced us to begin a study

of lead poison in New York State. The preliminary inquiry was conducted under the direction of the Commission by Dr. E. E. Pratt, Assistant Professor of Economics and Statistics in the New York School of Philanthropy. With the aid of a staff of students he has inspected over fifty establishments, and investigated over 100 cases of lead poisoning, in addition to making a preliminary investigation of arsenical poisoning. Dr. Pratt's report is herewith presented to the Commission.

3. The difficulty of regulating the conditions surrounding the employment of little children and all the members of the family in "home work" in the tenements has led the National Child Labor Committee to urge the Legislature during the last session to create a Special Commission to study this most important subject.

In view of the fact that this matter legitimately enters into the scope of the work of this Commission, and in view of the earnestness which the Commission has shown in the pursuit of its investigation, the National Child Labor Committee has (in the person of its general secretary, Mr. Owen R. Lovejoy), volunteered to start under the auspices of this Commission a preliminary inquiry into the extent of home and child labor in this city. The memorandum is herewith presented.

4. *Industrial Survey of a District:* A special industrial survey of a district in New York City embracing the section between 34th and 53rd streets, West of Eighth avenue, in all containing 76 blocks, was made under the auspices of the Commission by a staff of inspectors under Miss Pauline Goldmark, in charge of the Bureau of Social Research of the New York School of Philanthropy. A special report by Miss Goldmark is presented to the Commission.

5. Voluntary assistance in several investigations has also been rendered by several members of the Women's Welfare Department of the National Civic Federation, who investigated a tenement house block for the Commission, and by Mr. Stern of the East Side Neighborhood House.

TABLE No. 3.

NUMBER OF MANUFACTURING ESTABLISHMENTS AND WORKERS INSPECTED COMPARED WITH  
ACTUAL NUMBER OF ESTABLISHMENTS AND WORKERS IN STATE (U. S. CENSUS,  
1910, PRELIMINARY REPORT.)

	NO. INVESTIGATED		NO. IN STATE		% Estab- lishments inspected	% Work inspected
	Estab- lishments	Workers	Estab- lishments	Workers		
Printing .....	293	6,659	4,426	94,893	6	6
Tobacco .....	100	2,677	3,371	36,197	3	7
Chemicals .....	93	1,739	*293	*14,267	32	12
<i>Foodstuffs.</i>						
Bread .....	417	3,021	3,976	29,059	11	9
Candy .....	54	1,810	**249	**10,116	24	18
Ice cream .....	5	50				
Pickles .....	6	470	790	8,818	1	5
Spices and drugs .....	8	341	***86	***2,504	9	14
Sugar refineries .....	3	3,400	5		60	
Mineral waters .....	51	443	x241	x1,377	21	30
Meat packing .....	5	987	238	7,583	2	13
<i>Women's Trades.</i>						
Artificial flowers and feathers .....	94	1,891	319	9,813	30	19
Laundries .....	110	7,082	x*1,529	x16,631	7	43
Paper boxes .....	55	2,595	315	12,702	17	20
Clothing (waists) .....	200	11,582	3,038	114,925	6	10
<i>Miscellaneous.</i>						
Corks .....	19	611	32	928	59	66
Rag sorting .....	10	331	**	**		
Textiles .....	7	1,513	64	9,907	11	15
Human hair .....	67	547	132	2,733	51	20
Dyeing and cleaning .....	19	929	81	5,782	23	16
Other trades .....	222	14,696	25,750	625,656	1	2
Total .....	1,838	63,374	44,935	1,003,891	4	6

\* Figures taken from report State Dept. Labor, 1910.

x\* Includes ice cream factories.

\*\* Figures not given in census report.

\*\*\* Includes coffee grinding establishments.

## PERSONNEL:

The Commission was fortunate in having been able to secure the services of a very competent staff of inspectors, notwithstanding the temporary character of the work and the comparatively meager compensation. The following is a list of the names and qualifications of the inspectors:

Violet Leonard Pike, A. B., Vassar College, 1907, Secretary and Special Investigator.

Louise Carey, Bryn Mawr College.

Archibald Oliver Wood, M. D., Long Island College Hospital, Kingston Avenue Hospital.

Herbert S. Warren, B. S., Graduate College of the City of New York, practical printer.

Harvey B. Matthews, M. D., Columbia University.

R. Stuart Owens, A. B., Cornell University.

D. E. Roelkey, Graduate Fordham College.

D. Cummings.

Elizabeth Wettingfeld, Ph. B., Syracuse University.

Marie Kasten.

Joseph Ball, machinist.

Ida Rovinsky, M. D.

Clara Lemlich.

Max Halpern, Ph.D., Columbia College.

TABLE No. 4.

NEW YORK STATE FACTORY COMMISSION—INVESTIGATING COMMITTEE.  
SALARY ACCOUNT, SEPTEMBER 25TH, 1911, THROUGH FEBRUARY 1, 1912.

NAME	Position	Service begun	Service ended	Time served	Total salary
Dr. George M. Price	Director			3 months	\$1,500.00
H. F. J. Porter	Fire Expert			2 months	500.00
A. L. A. Himmelwright	Fire Expert			2 months	200.00
David S. Ludens	Inspector	Sept. 27th	Nov. 18th	51 days	192.48
E. B. Gowin	Inspector	Sept. 27th	Nov. 18th	51½ days	194.24
R. Stuart Owens	Inspector	Oct. 9th	Nov. 11th	1 month	100.00
Archibald O. Wood	Inspector	Oct. 9th	Nov. 11th	1 month	100.00
Herbert S. Warren	Inspector	Oct. 9th	Nov. 11th	1 month	100.00
Harvey B. Matthews	Inspector	Oct. 9th	Nov. 11th	1 month	100.00
Elizabeth Wettingfeld	Inspector	Oct. 9th	Dec. 1st	6 weeks	160.00
David Cummings	Inspector	Oct. 17th	Nov. 18th	1 month	100.00
D. E. Roelkey	Inspector	Oct. 16th	Nov. 18th	1 month	102.00
Max Halpern	Inspector	Oct. 9th	Nov. 11th	1 month	100.00
Dr. I. Rovinsky	Inspector	Dec. 4th	Dec. 16th	2 weeks	36.00
Clara Lemlich	Inspector	Dec. 5th	Dec. 16th	11 days	33.00
Louise Carey	Inspector	Oct. 23rd	Dec. 2nd	6 weeks	145.00
Marie Kasten	Inspector	Oct. 30th	Nov. 11th	2 weeks	36.00
J. Ball	Inspector	Nov. 20th	Dec. 2nd	2 weeks	55.00
J. Davis	Inspector			1 week	22.00
Dr. Michael Barsky	Physician	Oct. 30th		13 days	52.00
Dr. A. Rieger	Physician	Oct. 30th		11½ days	46.00
Dr. I. Workman	Physician	Oct. 30th		9 days	36.00
Dr. H. Langworthy	Physician	Oct. 30th		5 days	20.00
Clara Salem	Stenographer	Sept. 25th	Nov. 25th	9 weeks	135.00
Violet Pike	Secretary	Sept. 26th	Jan. 20th	17 weeks	381.66
Estelle Barsky	Asst. Sec'y	Oct. 30th	Jan. 20th	12 weeks	136.00
Beatrice Rose	Typist	Jan. 16th	Jan. 27th	3 weeks	32.00
Rebecca Kasovitch	Clerical Asst.	Jan. 15th	Jan. 27th	3 weeks	21.00
Mary Carnela	Clerical Asst.	Jan. 5th	Jan. 6th	2 days	3.00
Arthur Caroti	Interpreter	Oct. 31st		5 days	20.00
S. Levin	Interpreter	Nov. 1st		½ day	1.00
J. Rosenbach	Interpreter	Nov. 1st		2 days	4.00
Anton Lutz	Interpreter	Nov. 1st		1 day	2.00
Dr. J. Radda	Physician	Nov. 8th		2 days	10.00
Total salaries					\$4,675.38



TABLE No. 5.

NEW YORK STATE FACTORY COMMISSION.  
FINANCIAL REPORT—JANUARY 27, 1912.

APPROPRIATION .....			\$5,500.00
DISBURSEMENTS			
Salaries: (For detailed statement see Table 4).....		\$4,675.38	
Expenses of inspectors:			
Traveling expenses of Director and Mr. Porter .....	\$149.22		
Expenses of four inspectors up State.....	160.55		
Expenses of fourteen inspectors in N. Y. City.....	130.41		
Total expenses of inspectors .....		440.18	
Equipment:			
Badges.....	44.00		
Thermometers.....	27.25		
Photographs.....	55.75		
Rulers, Portfolio, lamps, book.....	16.24		
Rent typewriter.....	2.50		
Total expenses equipment.....		145.74	
Office expenses:			
Supplies.....	43.27		
Stamps.....	10.79		
Express charges.....	5.00		
Notary's fees.....	2.36		
Extra typewriting.....	35.21		
Total office expenses.....		96.63	
Printing.....		142.07	
Total disbursements.....		\$5,500.00	

## RESULTS OF THE DATA OBTAINED BY THE INVESTIGATION

### 1. NEGLECT OF THE HUMAN FACTOR.

Brief as was the period devoted to the investigation, limited as was the number of industries and establishments inspected, and incomplete as was necessarily all our data, the conclusion that forcibly impressed itself, after the completion of the preliminary investigation, was that the human factor is practically neglected in our industrial system.

Many of our industries were found housed in palatial loft buildings, and employing the most improved machinery and mechanical processes, but at the same time greatly neglecting the care, health and safety of their employees. Our system of industrial production has taken gigantic strides in the progressive utilization of natural resources and the exploitation of the inventive genius of the human mind, but has at the same time shown a terrible waste of human resources, of human health and life.

It is because of this neglect of the human factor that we have found so many preventable defects in industrial establishments; such a large number of workshops with inadequate light and illumination, with no provision for ventilation, without proper care for cleanliness, and without ordinary indispensable comforts, such as washing facilities, water supply, toilet accommodations, dressing-rooms, etc. It is because of utter neglect on the part of many employers that so many dangerous elements are found in certain trades. These elements are not always necessary for the successful pursuit of the trade, and their elimination would mean a great improvement in the health of the workers, and would stop much of the misery caused by the occupational diseases incident to certain industries.

It is true that many enlightened employers, especially those who control large establishments, show a commendable zeal for the health of their operatives, but such care not being supervised or organized under scientific direction, leaves much to be desired.

In the matter of industrial production, we are still under the sway of the old "*laissez faire*" policy, and there is still very

inadequate supervision of industries with a view to lessening dangers to the health and life of the working class.

There is still no regulation whatever of factory construction, outside of the rules adopted by municipal building codes which regulate only the width of walls, the strength of foundations, etc. All matters of sanitation are without control during the times when such control could best serve the purpose of the buildings and the interests of those destined to inhabit them.

The construction of tenement houses in New York City is under the strict supervision of the Tenement House Department. There is no reason why the interests of the greater number of persons inhabiting factory buildings should not be conserved as much as the interests of the tenement house dwellers.

## 2. IGNORANCE OF THE NUMBER AND OF THE LOCATION OF INDUSTRIAL ESTABLISHMENTS.

In the course of the investigation, much difficulty was found in locating all the establishments in an industry or a district. At present there is no method by which every manufacturing establishment may be located, and its existence brought to the attention of the authorities. At present, any person who has the necessary capital or credit may build, lease, or hire any ramshackle building, engage as many workers as he can crowd into his premises, and work them under any conditions. The very existence of this establishment may not be known to the Labor Department, until it is discovered by accident.

In the investigation of the Cloak and Suit Industry, made during the last year, by the Joint Board of Sanitary Control, about 30 per cent of the shops were found unrecorded, and in our own investigation, our inspectors found the utmost difficulty in tracing many establishments which were never recorded by the Labor Department in the list sent by them to us.

TABLE No. 6

TABLE SHOWING TYPES OF BUILDINGS OCCUPIED BY ESTABLISHMENTS INVESTIGATED, CLASSIFIED ACCORDING TO INDUSTRIES.

NOTE—In this table the unit is the establishment, in other tables the floor or shop.

	TOTAL ESTAB- LISH- MENTS	SPECIAL FACTORY		LOFT		TENE- MENT		CON- VERTED TENE- MENT		DWELL- ING		MISCEL- LANEOUS	
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Printing.....	293	18	6	181	62	19	6	34	12	41	14	0	0
Tobacco.....	100	8	8	61	61	20	20	1	1	10	10	0	0
Chemicals.....	93	78	84	11	12	0	0	0	0	4	4	0	0
<i>Foodstuffs.....</i>	<i>131</i>	<i>41</i>	<i>31</i>	<i>23</i>	<i>18</i>	<i>39</i>	<i>30</i>	<i>9</i>	<i>7</i>	<i>18</i>	<i>13</i>	<i>1</i>	<i>1</i>
Candy.....	54	26	48	11	20	3	6	9	16	4	8	1	2
Pickles.....	6	3	50	3	50	0	0	0	0	0	0	0	0
Spices and drugs.....	8	6	75	2	25	0	0	0	0	0	0	0	0
Ice cream.....	51	5	10	3	6	36	71	0	0	7	13	0	0
Meat packing.....	7	1	14	2	29	0	0	0	0	4	57	0	0
<i>Women's Trades.....</i>	<i>457</i>	<i>46</i>	<i>10</i>	<i>306</i>	<i>67</i>	<i>40</i>	<i>9</i>	<i>18</i>	<i>4</i>	<i>38</i>	<i>8</i>	<i>9</i>	<i>2</i>
Artificial flowers and feathers.....	94	3	3	49	52	11	12	2	2	29	31	0	0
Laundries.....	110	34	31	34	31	26	24	0	0	7	6	9	8
Paper boxes.....	200	9	17	41	77	0	0	1	2	2	4	0	0
Clothing (waists).....	53	0	0	182	91	3	1	15	8	0	0	0	0
<i>Miscellaneous.....</i>	<i>131</i>	<i>41</i>	<i>31</i>	<i>32</i>	<i>24</i>	<i>6</i>	<i>5</i>	<i>44</i>	<i>34</i>	<i>7</i>	<i>5</i>	<i>1</i>	<i>1</i>
Corks.....	14	8	60	4	30	0	0	2	10	0	0	0	0
Rag sorting.....	24	14	58	6	25	0	0	0	0	3	13	1	4
Textiles.....	7	6	87	1	13	0	0	0	0	0	0	0	0
Human hair.....	67	0	0	20	30	1	1	42	63	4	6	0	0
Dyeing and cleaning..	19	13	69	1	5	5	26	0	0	0	0	0	0
Total.....	1,205	232	19	614	51	124	10	106	9	118	10	11	1

495 bake shops are not included in this table. The miscellaneous trades inspected by the Bureau of Social Research are also not included.

### 3. LACK OF STANDARDS:

The worker spends the greater part of his waking hours in the workshop and factory. The proper sanitation of the workplace is therefore of paramount importance to the worker, both to his health and to the security of his life.

It is only lately that intelligent employers have awakened to the fact that factory sanitation is very closely related to industrial efficiency, and that neglect of this subject by factory owners is detrimental to their own interests as well as extremely injurious to their workers.

It is also but lately that the workers themselves have realized the value of proper sanitation of factories, and have added this to the economic demands of their labor organizations.

Unfortunately, there is hardly a field of science where there is such a complete lack of standards as in industrial hygiene.

It is on account of this deplorable lack of standardization that many provisions of the labor laws are so vague and indefinite, and that large employers, willing to introduce modern safety devices and sanitary conveniences in their factories, are unable to do so with complete success. It is also this lack of standards that makes the enforcement of the sanitary clauses of the labor laws so unsatisfactory, for it is a most difficult matter for the inspector to exactly determine what is meant by "sufficient" fire protection, "proper" light, "adequate" ventilation, "fit" toilet accommodations, etc.

The standardization of factory sanitation is one of the most important matters which the Commission has considered during its brief preliminary investigation, and we intend to devote much attention to it if our activities are continued.

#### 4. LIGHT AND ILLUMINATION:

The lack of standards is nowhere more acutely felt than in the lighting and illumination of workshops.

According to the unanimous testimony of experts, defective light and illumination are most injurious to the eyes of the workers. Insufficient light causes eye-strain and the chain of symptoms following it, and thus gradually undermines the health. Much of the work in factories needs close application; the colors necessitating abundant light, and the work so minute that great strain is placed upon the eyes. Therefore abundant light is the first necessity in a factory.

The investigation has shown that a large number of factories inspected are defective in light; that fifty-two per cent use artificial light during the day time; that the light, even where sufficient, is not properly placed with relation to the operatives; that very often the illuminants are too near the workers; that no protection whatever from glare of artificial illuminants is given in a large proportion of the shops.

The installation of artificial illumination is usually made without due regard to the location of the workroom, its size, the distance from the workers, the color of the materials, and the care of the eyes of the workers. It is, therefore, not at all strange that so many of the workers, especially the women, suffer from the effects of eye-strain and from other eye diseases due to defective light.

It is not only the small shops on the East Side that suffer in this respect. Many of the large industrial establishments made a depressing effect on the writer with their sombre, semi-dark, prison-like aspect.

TABLE No. 7.

SHOPS IN SELECTED INDUSTRIES, CLASSIFIED ACCORDING TO LIGHT AND VENTILATION

	TOTAL No. SHOPS	SHOPS USING ARTIFICIAL LIGHTS DURING DAY		SHOPS HAVING LIGHTS WITHOUT PROTECTION FROM GLARE		SHOPS USING MECHANICAL VENTILATION		SHOPS USING SPECIAL DEVICES	
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Printing.....	426	244	57	234	57	26	6	58	13
Tobacco.....	157	22	14	8	5	16	10	38	24
Chemicals.....	217	214	98	108	50	28	13	71	32
<i>Foodstuffs.</i>									
Candy.....	156	91	60	140	90	4	3	7	4
Ice cream.....	5	4	80	5	100	0	0	0	0
Pickles.....	27	22	81	18	66	5	19	4	15
Spices and drugs.....	34	18	53	3	9	4	12	0	0
Mineral waters.....	63	42	66	42	66	0	0	3	5
Meat packing.....	19	15	79	16	84	3	16	4	21
<i>Women's Trades.</i>									
Artificial flowers and feathers.....	120	20	16	116	96	7	6	3	3
Laundries.....	244	102	42	113	46	109	44	96	40
Paper boxes.....	135	34	25	117	87	20	15	5	4
Clothing (waist).....	228	141	62	132	60	0	0	0	0
<i>Miscellaneous.</i>									
Corks.....	22	5	23	18	22	2	9	0	0
Rag sorting.....	38	3	8	20	53	0	0	0	0
Textiles.....	28	10	36	14	50	2	7	7	25
Human hair.....	131	25	19	119	90	0	0	0	0
Dyeing and cleaning.....	69	11	16	8	12	13	19	1	2
Total.....	2,119	1,023	48	1,231	58	239	12	297	14

## 5. AIR AND VENTILATION:

Adequate ventilation of factories is perhaps even more important than adequate light and illumination, but we find here the same lack of standards.

The removal of foul air from our houses and its replacement by fresh and pure air from the outside is most necessary to the health of the dwellers. It is of still greater importance in factories, where the number of persons employed is so large, and where many activities are commonly carried on causing a larger consumption of air, and where the materials and processes are often such that much dust and many different noxious gases and fumes are constantly evolved.

And yet only fourteen per cent of all the establishments investigated have attempted, with more or less success, the introduction of proper ventilation by installing mechanical devices for the removal of bad air or the introduction of fresh air. The remaining eighty-six per cent rely solely upon the windows, which, being closed in the cold weather, fail to serve as ventilating media, while in summer they are practically useless, since the temperature of the inside and outside is nearly equal and very little change of air takes place.

Professor C. E. A. Winslow, an acknowledged expert on ventilation, testified that a temperature above 75 degrees Fahr. and a wet bulb temperature above 70 degrees Fahr. are extremely injurious to health, and yet, in our investigation, many places were found where this temperature was greatly exceeded, while in some, which were inspected by myself, a dry bulb temperature of 98 degrees Fahr. and a wet bulb of 90 degrees were found recorded upon the thermometer. A superintendent of one of the sugar refineries testified that the temperature sometimes reached 110 degrees Fahr.

It has been accepted by most sanitarians that the greater incidence of tuberculosis and other respiratory diseases among workers, especially among those working in dusty trades, is due to the lack of ventilation, and a definite and compulsory minimum standard of ventilation for every establishment is most necessary for the proper enforcement of the labor laws.

Closely allied to the question of ventilation is the subject of overcrowding in factories.

The present law requiring 250 cu. feet air space for each operative is very inadequate. In an ordinary loft, with a ceiling of the average height of ten feet, this provides a floor space for each

worker approximately 5 x 5 feet. In calculating the cubic space, no deductions are made for bulky machinery, boxes, tables, etc.

A cubic space of 400 feet for each adult worker, clear of all bulky machinery, goods, and tables, should be insisted upon in all factories, with the additional standard of a floor space of 40 square feet per person, and a passageway of three feet between working benches and machine-stands.

A standard of ventilation based upon the amount of  $C O_2$  should also be required. A bill creating such a standard was introduced in the last Legislature upon the recommendation of the New York Association for Labor Legislation.

The fact that there are many industries and many industrial establishments where the temperatures are so high as to be dangerous to the health of the operatives, shows that there should also be some standard as to degree of temperature permitted in the workrooms.

"The securing and maintaining of a reasonable temperature in workrooms" is one of the basic principles of factory sanitation, and power should be given to the Labor Department to make special rules regulating the temperatures of industries where extremes of temperatures are likely to occur, and also to compel the owner to install self-recording thermometers to be maintained and kept in working order.

The subject of mechanical ventilation in the industries where excessive dust is produced, or where poisons, gases, and fumes are evolved, is covered in Section No. 86 of the Labor Law, and is very vague, indefinite, and unsatisfactory, as has been shown during the course of our investigation; only fourteen per cent. of the workshops having any ventilation plants. These plants were very seldom in good working order. In many industries where the danger of dust, poison, gases and fumes are obvious, there was a lamentable lack of ventilation.

The installation of a good working ventilating plant with proper hoods to remove the dusts, gases and fumes from the working places should be insisted upon and made part of the Factory Law, as such plants are absolutely necessary for the prevention of many of the diseases to which the operatives in certain trades are subject.



## 6. SANITARY CARE AND COMFORTS:

Nothing so well illustrates the habitual neglect of the sanitary care of workshop as the need of making laws to enforce ordinary cleanliness. Our investigations have shown that in the great majority of cases even these laws are disobeyed.

It is of the utmost importance to the health of the workers to provide ample washing facilities in the shops, especially in establishments where dust is evolved, or where various poisons are produced, and there is danger of their absorption through the hands and mouth.

Our inspectors found very little attention paid to this most important matter. In fifty-four per cent of all establishments inspected, there were no, or insufficient, washing facilities. In some industries the percentage of places with inadequate facilities is much larger. For instance in the ice-cream, textile, dyeing and cleaning establishments *not one* shop had any washing-rooms or wash basins. In the chemical manufacturing establishments where washing facilities are of such importance and where their absence is fraught with actual danger to health, there were only forty-one establishments out of a total of ninety-three which did have some kind of wash-basins.

Even the establishments where the washing facilities were otherwise adequate very seldom provided any hot water, which is absolutely necessary where considerable dust or special poisons are to be found.

### *Lunch Rooms:*

The number of industrial establishments providing separate lunch rooms is very small. The percentage of such establishments ranges from zero to fourteen in the different industries. In almost all of the shops, therefore, lunch was eaten within the shop or at a bench-table, a procedure which is very dangerous to health in the shops where there is much dust or where dangerous chemicals or poisons are handled.

TABLE No. 8.

MANUFACTURING ESTABLISHMENTS IN SELECTED INDUSTRIES CLASSIFIED ACCORDING TO SPECIAL CONVENIENCES.

	TOTAL No. ESTAB- LISHED.	ADEQUATE WASHING FACILITIES		SEPARATE LUNCHROOMS.	
	No.	No.	Per cent.	No.	Per cent.
Printing.....	293	239	82	2	1
Tobacco.....	100	79	79	9	9
Chemicals.....	93	41	44	6	6
<i>Foodstuffs.</i>					
Candy.....	54	27	50	7	13
Ice cream.....	5	0	0	0	0
Pickles.....	6	4	66	0	0
Spices and drugs.....	8	3	38	1	12
Meat packing.....	7	1	14	0	0
Mineral waters.....	51	13	25	0	0
<i>Women's Trades.</i>					
Artificial flowers and feathers..	94	8	8	0	0
Laundries.....	110	13	12	6	5
Paper boxes.....	53	19	36	3	6
Clothing (waists).....	200	126	63	5	3
<i>Miscellaneous.</i>					
Corks.....	14	14	14	0	0
Rags.....	24	10	42	0	0
Textiles.....	7	0	0	1	14
Human hair.....	67	58	86	3	5
Dyeing and cleaning.....	19	0	0	0	0
Total.....	1,205	555	46	43	3

*Cleanliness:*

Ordinary cleanliness of walls, ceilings and floors was absent in a very large number of shops. We have classified the cleanliness of shops according to four grades: Grade "A," referring to perfectly clean shops; Grade "B," to shops in a fair condition; while Grades "C" and "D" refer respectively to dirty and very dirty shops. According to these grades we found 592 shops in Grade "C," and 364 in Grade "D," a total number of 45 per cent of all the establishments being in the two lower grades. This grading of cleanliness of industrial establishments excludes the 500 bakeries inspected, which are reported upon separately.

It is strange to note that establishments where food-stuffs are manufactured were found the dirtiest of all. Thirty-three per cent of the candy factories were in Grade "C," and twenty-four per cent in Grade "D;" thirty-three per cent of the pickle factories were in Grade "C," and twenty-three per cent in Grade "D;" twenty-one per cent of all the meat packing shops in Grade "C," and fifty-eight per cent in Grade "D;" and eighty per cent of the ice cream factories in Grade "D."

TABLE No. 9.

MANUFACTURING ESTABLISHMENTS IN SELECTED INDUSTRIES ACCORDING TO GRADES OF CLEANLINESS.

	TOTAL No. SHOPS	GRADE A		GRADE B		GRADE C		GRADE D	
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Printing.....	426	72	16	227	53	102	24	27	7
Tobacco.....	157	4	3	75	47	56	36	22	14
Chemicals.....	217	28	13	123	57	62	28	4	2
<i>Foodstuffs.</i>									
Candy.....	156	11	7	57	36	51	33	37	24
Ice cream.....	5	0	0	1	20	0	0	4	80
Pickles.....	27	6	22	5	19	9	33	7	26
Spices and drugs.....	34	5	15	23	67	1	3	5	15
Mineral waters.....	63	1	2	15	24	21	33	26	41
Meat packing.....	19	3	16	1	5	4	21	11	58
<i>Women's Trades.</i>									
Artificial flowers and feathers.....	120	2	1	26	22	42	35	50	42
Laundries.....	244	34	14	81	33	74	30	55	0
Paper boxes.....	135	25	19	56	41	42	31	12	9
Clothing (waists).....	228	69	31	46	20	49	21	64	28
<i>Miscellaneous.</i>									
Corks.....	22	7	32	15	68	0	0	0	0
Rag sorting.....	38	8	22	3	8	17	45	10	26
Textiles.....	28	2	7	15	53	11	40	0	0
Human hair.....	131	6	5	52	39	42	32	31	24
Dyeing and cleaning.....	69	17	24	42	61	9	13	1	2
Total.....	2,119	300	14	863	41	592	28	364	17

*Toilet Accommodations:*

The investigation has shown a general neglect in making proper provision for toilet accommodations. There were none whatever in sixty-two shops, or three per cent of all the shops inspected. In ninety-five shops, or five per cent, the toilets were located in the yard, which is the worst place for them. In 146 shops, or twenty-one per cent, they were located in the halls, where they cannot be well taken care of.

An insufficient number of toilets was supplied for the employees in a large number of cases.

In regard to light and ventilation of toilet apartments there were three hundred and forty-two in Grade "D" and three hundred and fifty-eight in Grade "C," or thirty-two per cent.\*

In regard to cleanliness of toilets twenty-four per cent were in Grade "C" and sixteen per cent in Grade "D," showing that very little attention is paid to this very important feature.

\*Table II, p. 139.

These deplorable conditions are by no means a special feature of the small establishments; some of the largest industrial establishments are, at times, the greatest sinners in this respect. For instance, in the two largest sugar refineries in the city, belonging to the largest manufacturers in the country, I found the toilets not only inadequate in number, and obsolete in type, but kept in a shockingly filthy condition.

In spite of the fact that many accidents occur in factories, there are very few in which emergency rooms or first aid facilities were found.

The investigation has clearly shown not only the need of definite sanitary provisions in the labor code, but also the necessity of constant enforcement and supervision, without which such laws become dead letters.

TABLE No. 10.

SHOPS OF MANUFACTURING ESTABLISHMENTS IN SELECTED INDUSTRIES ACCORDING TO LOCATION OF TOILETS.

	TOTAL No. SHOPS	YARD		HALL		SHOP		ELSE- WHERE		No. W. C.		No REPORT	
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Printing.....	446	11	2	94	23	308	72	8	2	5	1	0	0
Tobacco.....	157	4	3	28	18	101	64	22	14	2	1	0	0
Chemicals.....	217	43	20	22	10	112	52	37	17	3	1	0	0
<i>Foodstuffs.</i>													
Candy.....	156	3	2	93	60	49	31	5	3	3	2	3	2
Ice cream.....	5	0	0	0	0	2	40	0	0	3	60	0	0
Pickles.....	27	0	0	27	100	0	0	0	0	0	0	0	0
Spices and drugs.....	34	0	0	9	27	25	0	73	0	0	0	0	0
Mineral waters.....	63	3	5	19	30	26	41	1	2	14	22	0	0
Meat packing.....	19	2	11	0	0	7	37	9	47	1	5	0	0
<i>Women's Trades.</i>													
Artificial flowers and feathers.....	120	2	2	31	25	83	69	0	0	4	4	0	0
Laundries.....	244	6	2	28	12	182	75	6	2	4	2	18	27
Paper boxes.....	135	0	0	16	12	114	84	0	0	5	4	0	0
Clothing (waists).....	228	0	0	3	1	223	98	0	0	2	1	0	0
<i>Miscellaneous.</i>													
Corks.....	22	0	0	1	5	21	95	0	0	0	0	0	0
Rag sorting.....	38	2	0	6	0	21	0	2	0	7	0	0	0
Textiles.....	28	0	0	1	3	25	90	1	3	0	0	1	3
Human hair.....	131	11	8	56	42	62	48	0	0	2	2	0	0
Cleaning and dyeing.....	69	7	11	12	17	38	55	4	5	8	11	0	0
Total.....	2,119	95	5	446	21	1399	65	95	5	62	3	22	1

TABLE No. 11.

SHOPS OF MANUFACTURING ESTABLISHMENTS IN SELECTED INDUSTRIES ACCORDING TO GRADES  
OF LIGHT AND VENTILATION OF TOILET APARTMENTS.

	TOTAL No. SHOPS	GRADE A		GRADE B		GRADE C		GRADE D		No TOILETS		No REPORT	
		No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.	No.	Per cent.
Printing.....	426	106	25	185	43	90	21	33	8	5	1	7	2
Tobacco.....	157	24	15	46	30	37	23	33	21	2	1	15	10
Chemicals.....	217	45	21	59	27	24	11	10	5	3	1	76	35
<i>Foodstuffs.</i>													
Candy.....	156	24	15	81	52	29	19	16	10	0	0	6	4
Ice cream.....	5	0	0	1	0	20	0	1	20	3	0	60	0
Pickles.....	27	5	19	12	44	8	30	2	7	0	0	0	0
Spices and drugs.....	34	13	38	10	30	9	26	2	6	0	0	0	0
Mineral waters.....	63	2	3	7	11	16	26	21	33	14	22	3	5
Meat packing.....	19	0	0	13	69	4	21	1	5	1	5	0	0
<i>Women's Trades.</i>													
Artificial flowers and feathers.....	120	5	4	56	47	28	23	27	22	4	3	0	0
Laundries.....	244	34	14	33	13	35	14	112	46	4	2	26	11
Paper boxes.....	135	76	56	25	19	19	14	10	7	5	4	0	0
Clothing (waists).....	228	35	15	84	36	41	18	66	30	2	1	0	0
<i>Miscellaneous.</i>													
Corks.....	22	20	91	2	9	0	0	0	0	0	0	0	0
Rag sorting.....	38	11	30	8	21	0	0	7	18	7	18	5	13
Textiles.....	28	16	56	8	30	3	11	0	0	0	0	1	3
Human hair.....	131	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dyeing and cleaning..	69	14	.....	16	.....	15	.....	1	.....	8	.....	15	.....
Total.....	2,119	430	20	646	34	358	16	342	16	58	2	285	12

TABLE No. 12.

SHOPS OF MANUFACTURING ESTABLISHMENTS IN SELECTED INDUSTRIES ACCORDING TO GRADES OF CLEANLINESS OF TOILETS

	TOTAL No. SHOPS	GRADE A		GRADE B		GRADE C		GRADE D		No TOILETS		No REPORT	
		No.		No.		No.		No.		No.		No.	
		Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Printing .....	426	94	23	212	50	83	19	25	6	5	1	7	1
Tobacco .....	157	17	11	50	31	47	30	23	15	2	1	18	12
Chemicals .....	217	42	19	86	40	31	14	12	6	3	....	43	19
<i>Foodstuffs.</i>													
Candy .....	156	15	10	52	33	61	40	24	15	3	2	1	....
Ice cream .....	5	0	0	0	0	0	0	2	40	3	60	0	0
Pickles .....	27	5	10	14	50	7	26	1	4	....	....	....	....
Spices and drugs .....	34	10	30	13	38	2	6	9	26	....	....	....	....
Mineral waters .....	63	0	0	9	15	19	30	19	30	14	22	2	3
Meat packing .....	19	2	10	1	5	9	49	2	10	1	5	4	21
<i>Women's Trades.</i>													
Artificial flowers and feathers .....	120	7	6	58	48	28	23	23	20	4	3	0	0
Laundries .....	244	45	18	53	22	24	10	96	40	4	1	22	9
Paper boxes .....	135	59	44	20	15	29	22	22	16	5	3	0	0
Clothing (waists) .....	228	30	14	69	30	59	25	68	30	2	1	0	0
<i>Miscellaneous.</i>													
Corks .....	22	5	23	10	45	7	32	....	....	....	....	....	....
Rag sorting .....	38	1	3	9	24	5	13	11	28	7	19	5	13
Textiles .....	28	....	0	13	46	11	40	3	11	0	0	1	3
Human hair .....	131	9	7	58	44	45	34	17	13	2	2	....	....
Dyeing and cleaning .....	69	20	29	15	22	7	11	4	5	8	11	15	22
Total .....	2,119	361	16	742	35	474	24	361	16	63	3	118	5

## 7. BAKERIES:

The manufacture of food-stuffs is of the greatest importance to the health not only of the workers in the establishments where such manufacture is carried on, but also to the general consuming public. For some reason or other, there seems to be much less care taken in the sanitation of places where food is manufactured than in any other branch of industry.

In New York City our investigation has shown that many food manufacturing trades such as candy, ice cream, smoked meats, and sausages, and especially bread, are almost exclusively carried on in low cellars of tenement houses under working conditions which defy all description.

The full report of the bakery inspection presented to the Commission (with photographs and detailed descriptions) shows the horrible conditions under which the "staff of life" is manufactured in this city, and the necessity of seriously considering an effective remedy for this great evil.

This thorough inspection of nearly 500 cellar bakeries and the testimony which was given at the hearing by many disinterested and competent persons, have shown beyond a doubt that something radical must be done if we are to prevent "our daily bread" from becoming a menace to the health of the workers, a peril to the safety of the buildings, and a disgusting product to the consuming public.

The time is ripe for a total abolition of cellar bakeries. There is no valid reason for, and all sanitary reasons against, such a location for the manufacture of this most important article of food.

While there may be some objections to a sudden total abolition of all existing cellar bakeries, there can be little objection to their control and strict supervision by the State and Municipal authorities. Such a supervision and control are possible only with a system of certification or licensing, similar to that in the milk and dairy industry.

#### 8. THE HEALTH OF THE WORKERS:

The normal pursuit of ordinary occupations under normal conditions is not fraught with danger to the health or the life of the workers; indeed, it is rather conducive to better health and longer life. It is only when work is carried on under abnormal conditions with relation to duration, speed, tension, character of workplace, degree of light and illumination, purity of air, and ordinary sanitary care, that work begins to be harmful to the worker, and may seriously affect his health and shorten his life.

A great many of our industries are at present carried on under such abnormal conditions that they unduly increase the morbidity and mortality rate of the workers.

The unsanitary conditions under which the bakers are employed in the cellar bakeries in New York City has led us to make a physical examination of 800 bakers, to determine, if possible, the effect of the unsanitary conditions and occupation upon their health. This examination has been made by a staff of competent physicians during the bakers' working hours and at their place of work. The examination has been greatly assisted by the Bakers' Union, which sent representatives to each shop, advising their

members to submit to such an examination. The result of this examination is described in full in the special report on bakers and bakeries. Here, it is sufficient to note the fact that we have found an abnormally large percentage of diseases among this class of workers, diseases which endanger the health and well-being of the workers themselves, and are also dangerous because of the possible infection of the manufactured food-stuffs.

At the request of the Furriers' Union, a preliminary physical examination of eighty-five furriers has also been made.

There is undoubtedly a great desire among the members of organized Labor Unions to undergo such physical examinations, and the evidence given in the public hearings has also shown that many of the large employers favor such a physical examination.

#### 9. DANGEROUS TRADES:

A large number of industries deal with harmful or poisonous materials, which are liable to endanger the health and lives of their workers. These dangerous elements may be roughly classified into five groups, as follows:

##### *Dangerous Elements:*

1. Dusts: Mineral, Metal, Vegetable, Animal.
2. Poisons: Lead, Arsenic, Phosphorous, Mercury, Brass, Zinc, etc.
3. Gases and Fumes.
4. Infected Materials; Rags, Skins, etc.
5. Dangerous and Unguarded Machinery.

The number of trades in which one or more of the above-named dangerous elements are found is very large; lead poisoning alone being incident to about 138 distinct trades. The effect of these elements upon the health of the workers are sometimes immediate and more often insidious, but nearly always harmful, and at times deadly.

There is as yet no sufficient data as to the exact number of persons suffering from diseases directly caused by each of these ele-



ments, nor is there in this country sufficient proof of the existence of the specific occupational diseases incident to certain trades. The only legislative commission that has ever studied this subject in this country is the Illinois Occupational Disease Commission of 1907-8, and there are some additional studies just completed and printed by the United States Department of Commerce and Labor in Bulletin No. 95.

Dangerous as are many of these industries, many of the risks are undoubtedly preventable and much of the misery caused by them is entirely avoidable. In many industries a non-toxic ingredient may be substituted for a poison as in the match and mirror industries. In others an efficient system of mechanical ventilation would eliminate most of the dangers; while in others a proper education of the workers in the dangers of their trade is needed.

The extent of mercury poisoning in New York City has been lately studied by Mrs. Lindon W. Bates of the National Civic Federation, who reported on over a hundred cases of mercurial poison occurring among hatters and felt-makers.

In the United States Department of Labor and Commerce Bulletin No. 95, just issued, Dr. John B. Andrews gives a short account of a study of lead poisoning cases in New York State. During 1909 and 1910 there were found sixty cases of death from lead poison.

A beginning has been made under the auspices of this Commission in investigating a number of cases of lead poisoning and inspecting a number of lead manufacturing establishments in this city. This investigation has been voluntarily conducted by Dr. E. E. Pratt of the New York School of Philanthropy, who with a staff of pupils has made a thorough inspection of fifty factories, and has traced from hospital records, etc., a large number of cases of lead poisoning. A special report on 100 cases of lead poisoning by Dr. E. E. Pratt is herewith presented to the Commission.

#### 10. INDUSTRIAL HYGIENE:

The existence of many specific poisons and dangers to the health of workers in various industries, the incidence of occupational dis-

eases in many trades, the effect of certain processes upon the physique of the workers, render it necessary to continue and pursue special investigations into industrial conditions. This must be done in order to study the effects of the occupation upon the health of the workers, to establish standards for each industry, to prepare rules and regulations, and to recommend preventive measures for their elimination.

Such a continued and intensive study can best be carried on by a special bureau, attached to the Labor Department, with trained specialists on industrial hygiene, and with power to recommend special rules for each particular trade and establishment.

All these functions with the addition of the supervision of the technical details of industrial hygiene, such as the matter of proper safeguarding of dangerous machinery, the installation of special mechanical ventilation plants, the supervision of light and illumination, the chemical analysis of air, chemicals, dyes, etc., should be concentrated in a separate bureau in the Labor Department with a staff of specialists in each branch and with ample provisions for laboratories, clinics, and research, as well as for educational activities among employers and workers alike.

#### 11. WOMEN'S WORK:

In the course of our investigation, certain trades where many women workers are employed have been investigated as to their sanitary conditions, and a special report on these trades is herewith presented to the Commission. The evidence presented in this report, as well as the testimony given in the public hearings, undoubtedly created a strong impression that there is not sufficient protection in our industries for women workers, and that they unquestionably suffer more from certain bad sanitary conditions than the male workers.

The number of industries which are especially dangerous to women is large, and the subject of further restriction of the trades in which women may be employed deserves serious study and attention.

There is also need of a further study for the purpose of further limiting the hours of labor of women in *all* trades, and with a

possible establishment of a minimum wage for women workers, as the only means to preserve their health and prevent them from sinking down under the burdens of industrial life.

## 12. CHILD LABOR:

During our investigation, we have found many instances of the employment of extremely young children in factories. Our impression is that the extent of the employment of children under fourteen years of age is larger than it is thought to be, and that the present system of certification of child workers fourteen and sixteen years of age is inadequate and unsatisfactory. Many abuses have distinctly been observed in the methods of granting certificates, and the lack of a thorough medical physical examination of minor workers has been shown to be dangerous in fostering the employment of children too young to be given up to the risks and dangers of factory work.

The absolute need of a system of physical examination of children, and indeed, of all workers, before and after entering employment has been fully shown.

## 13. HOME WORK:

A special investigation has been made under the auspices of this Commission, by a volunteer staff under the direction of the National Child Labor Committee, upon the extent of child and home work, especially in the tenement houses. A special report on this subject is herewith presented to the Commission. Here it is sufficient to give a summary of their report:

1. The present system of licensing tenement houses leads to many abuses and does not fulfill the expectations of the framers of the law.
2. The extent of the work carried on in unlicensed tenement houses is very great.
3. The number of industries which are carried on in homes and by small children is very large.
4. It is hardly possible to entirely eliminate child labor without complete abolition of tenement house work.

## 14. EDUCATION:

Many of the evils discovered in our investigation may directly be traced to the lack of knowledge on the part of employers of the proper construction and arrangement of factories and workshops, and to their ignorance of the first principles of sanitation and proper care for the health and well-being of their workers.

The government appropriates yearly vast sums for the instruction of the farmers and other producing classes of the nation — for the purpose of teaching them how disease of cattle can be cured and how the health of valuable animals can be preserved, and cholera among chickens prevented. There is, however, absolutely no provision made by the government for the similar instruction of employers to whose care hundreds of thousands of human beings are entrusted, nor for any supervision of the conditions which the employing classes impose upon their workmen.

The ignorance which is so frequently found among the working class itself is even more dangerous to their health. There is at present among the workers dense ignorance of the risks of their trades and the dangers of their occupations. Many of the diseases from which workmen suffer in certain trades are directly due to their lack of knowledge of means of preserving their health, and of their neglect in taking ordinary precautions to guard against certain dangers which are easily preventable, once they are known.

The younger element among the workers is composed of children who leave school at the age of fourteen, who are entirely unprepared for the struggle for existence, who are entirely ignorant of the first principles of self-preservation, and who, therefore, readily fall victims to the dangers lurking in so many industries.

This lack of education in employers and employees is a serious menace in industrial life, and is one of the principal causes of suffering in almost all occupations.

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The preliminary report touches upon subjects which will be discussed more fully in the final report.

### III. RECOMMENDATIONS:

#### (1) *Registration:*

The owner of every factory shall be required to register at the Labor Department within a specified time, giving such data as the Labor Commissioner may require.

#### (2) *Licensing:*

Every place where food products are manufactured for public consumption (except restaurants and hotels) shall be required to apply for a license from the Health Department of the city where such place is located; said license shall be issued only when all the requirements of said Health Department are fully complied with; said license shall be revocable for cause and be annually renewed upon inspection.

#### (3) *Standards to be established:*

The Department of Labor shall be empowered to establish from time to time standards of light, heat, and ventilation to be enforced in factories for the protection of the workers; every factory in which dusts, gases, poisons, or fumes are produced in excess of the minimum allowed, or where materials likely to convey infection are used, shall be required to secure a permit from the Department of Labor, and shall be under the continuous supervision of said Department; compliance with the standards established by the Department shall be required before a permit is issued to such factory.

#### (4) *Physical Examination of Workers:*

The owner of every place where food products are manufactured for public consumption (except restaurants and hotels) shall demand and receive from each applicant for work before employing same, a certificate of good health signed by a regularly licensed physician, to the effect that said person is free from infectious disease and that he is in physical condition to do the work in said establishment.

(5) *Medical Supervision in Dangerous Trades:*

The owner of every factory in which certain specified poisons, gases, fumes or dusts are produced, or in which materials likely to carry infection are used, shall be required to employ a physician or physicians to examine all workers before entering their employment, and to make a periodical examination at least once a month of all employees, in order to determine whether their health is affected by the dangerous elements in the trade. Such physicians shall keep an individual record of every employee in said establishment. Such physicians shall be under the general supervision of the Labor Department and under the rules and regulations set by said Department for the medical supervision of the trade.

(6) *Ventilation:*

(a) Four hundred cubic feet of space, exclusive of furniture, machinery, or goods, shall be required in every factory for each adult worker.

(b) Forty square feet of floor space, exclusive of bulky furniture, machinery, or goods, shall be required for every worker in every factory.

(c) Nine parts of carbon dioxide, in ten thousand volumes of air, in excess of the number of parts of carbon dioxide in ten thousand volumes of the exterior air shall be the maximum permissible amount in each and every workshop or factory, and fifteen parts of CO<sub>2</sub> in ten thousand volumes of air, in excess of the exterior air shall be the maximum permissible in every workroom where artificial light is needed.

(d) The lowest temperature allowed in a workroom of a factory shall be 55 degrees Fahr. and the maximum shall not exceed 72 degrees Fahr. as determined by the wet bulb thermometer, unless the temperature of the exterior air exceeds 70 degrees Fahr. as determined by the same process, in which case the wet bulb temperature of the workroom shall not exceed that of the exterior air by more than 5 degrees.

(e) Several dry and wet bulb recording thermometers shall be installed and properly maintained in all factories, as may be required by the Department of Labor.

(7) *Dressing Rooms:*

(a) In all factories where more than 10 women are employed, a separate dressing room, having a floor space of at least 60 square feet, shall be provided on each floor where such women are employed. Said dressing room shall have at least one window, at least 15 square feet in area, to the outer air, and shall be adequately lighted and ventilated, and shall be provided with suitable hangers for clothes, and shall be separate from any water-closet apartment.

(b) In all establishments where food products are manufactured for public consumption, and in all establishments where dusts, gases, poisons, fumes or material likely to convey infection are produced, special clothes, consisting of overalls, caps and gloves, shall be provided free for every employee; such clothes shall be washed at the expense of the owner at least twice every week; and every employee compelled to wear same at all times during such work.

(8) *Washing Facilities:*

(a) General. Section No. 88 of Labor Code prevails.

(b) In all establishments where food products are manufactured for public consumption, and in all establishments where dust, gases, poisons, fumes, or material likely to convey infection are produced, there shall be provided ample washing facilities, including hot water and individual towels.

(9) *Lunch:*

In all establishments where food products are manufactured for public consumption, and in all establishments where dust, gases, poisons, fumes, or material likely to convey infection exist, separate places for eating lunch shall be provided, as may be required by the Labor Department.





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**APPENDIX II**

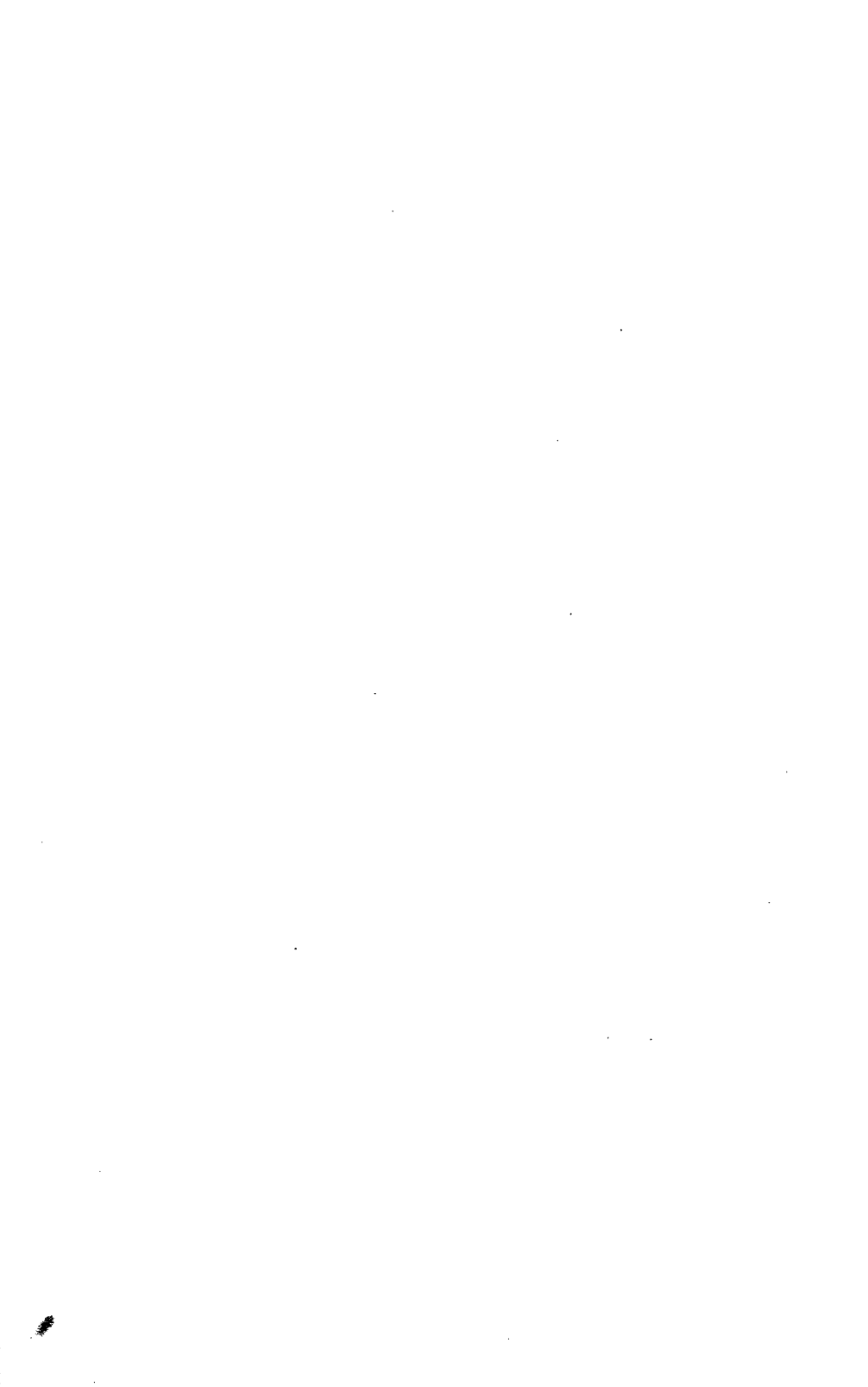
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**THE FIRE HAZARD**

H. F. J. PORTER, M. E.

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## THE FIRE HAZARD

HON. ROBERT F. WAGNER, *Chairman N. Y. State Factory Investigating Commission, New York, N. Y.:*

DEAR SIR:

*The Origin of the Commission:*

Your Commission came into existence last summer, primarily owing to representations made to the Governor and the Legislature by a delegation of the Fifth Avenue Association, to the effect that the factory buildings of New York City are so defective in design with regard to exit facilities, that their occupants are continuously exposed to the danger of a repetition of the Asch building disaster. In fact it was stated at the hearing before the Governor that in case of fire these people would have only the alternatives of jumping or burning to death. It was also stated that they would not even have to wait for a fire to expose them to danger, due to the defects mentioned, for a panic, which might be brought about by other sources than fire, could also cause serious injury and even death, as was made evident in the loft building at 548 Broadway on May 5th last, when the occupants of one of the floors, becoming frightened by a cry of alarm, rushed to the narrow wooden stairway and crowded it until it burst, and precipitated its contents upon the landing below, killing two girls and injuring many others so seriously as to necessitate their removal to the hospital.

*My Association with Its Origin:*

I have been engaged in work in the factory buildings of New York and other cities for many years, and at the time of the Asch building fire had been employed by the Fifth Avenue Association to solve certain problems in which the loft buildings in its section were involved. It was in connection with my efforts after the above-mentioned disaster, to institute fire drills in these loft buildings in order to facilitate the escape of their occupants in case of fire, that I discovered that it was impossible to develop a fire drill that would empty such buildings under emergency con-

ditions, and that this was due, not to incapacity on my part, nor to weakness in the fire drill *per se*, but to inherent defects in the design of the buildings, due to the failure of architects and builders generally to realize that the capacity of a stairway is limited, and that a multi-storied building, intended to be occupied by large numbers of people on each floor, must be supplied with special means of meeting the exigencies of a rapid egress from it.

### *Its Special Work:*

The Commission was appointed to investigate and recommend relief for the very serious and pressing situation which, as I have shown, was thus brought to light. This is its work, as I understand it, and if it will accomplish this result alone it will have performed a vitally effective service. In the working out of a recommendation in this direction, to the Legislature, you have asked me to act in an advisory capacity.

### *Its Allied Work:*

In establishing the Commission and endowing it with its functions, the Legislature thought it wise to authorize it, in addition to the above requirement, to investigate the sanitary conditions as they exist in the factory buildings of the State. There are many individuals, as well as the State and municipal organizations, at work in this latter field, and although it is thus fairly well covered, undoubtedly the Commission will find that it and they can be mutually helpful in recommending legislation which will alleviate the wretchedness that exists in factories of a certain type in every industry. This latter line of investigation you have assigned to Dr. Geo. M. Price, and although he and I have conferred and worked together in a mutual endeavor to facilitate the work of the Commission in every way possible, we shall keep our assignments distinct and separate in our respective reports, — I confining myself to the building problems, Dr. Price to working conditions.

### *Preliminary Experiences:*

In order that the Commission may have all the facts bearing upon the fire situation, it may be well to lay before it my experi-

ences in the field, which enabled me to interest the delegation above referred to sufficiently to cause it to go to Albany to ask for an investigation. These experiences, beginning several years ago and maintained up to the time of this investigation, are as important as those which I have had since I have been connected with the Commission, for the latter have simply been in continuity with the former.

### *A Typical Factory:*

When, in 1904, I took charge as Vice-President of the Nernst Lamp Company, a Westinghouse interest in Pittsburgh, Pa., I found its factory to be an old building of brick, with so-called interior mill construction. It possessed only one stairway and housed on its five floors somewhere between 200 and 300 people, mostly women. As the building in itself was full of inflammable material, and as it was surrounded by rolling mills and furniture storage warehouses, it was considered a very hazardous fire risk, and insurance rates upon it were proportionately high. Realizing my responsibility for the safety of the employees, I set about studying how they could escape from the building in case of fire.

### *My Efforts to Effect Escape from Fire:*

Not being able to determine to my own satisfaction how escape under certain circumstances could be effected, I appealed to the Chief of the Fire Department, who, after studying the conditions, agreed with me that the building was a fire trap, that he could offer no recommendations except more and better fire-escapes, the introduction of precautionary measures against fire, methods of prompt extinguishment in case of its occurrence, and means of retarding its spread until the arrival of the Fire Department, in case it should get beyond the control of those in the building who were designated to fight it.

### *The Province of the Fire Department is Primarily to Fight Fire, Not to Save Life:*

Not being satisfied, however, that even with the preventive measures introduced, the occupants of the building would be safe from the possibility of a fire gaining headway beyond the fighting

ability of those assigned to its extinguishment, and realizing that there still existed the possibility of accident from panics, which often cause more injury than the fire itself, I appealed to the managers of the most representative and progressive manufacturing establishments about the country, to learn what methods they had adopted to meet the dangerous conditions which I realized existed in every factory where large numbers of people were housed on each floor. Much to my surprise and disappointment, I could not find a single concern which had developed a scheme of rapid dismissal of its people from its building, similar to the fire drills of the public schools. I then sought the assistance of a drill master from the local Board of Education.

#### *The School Fire Drill Inapplicable:*

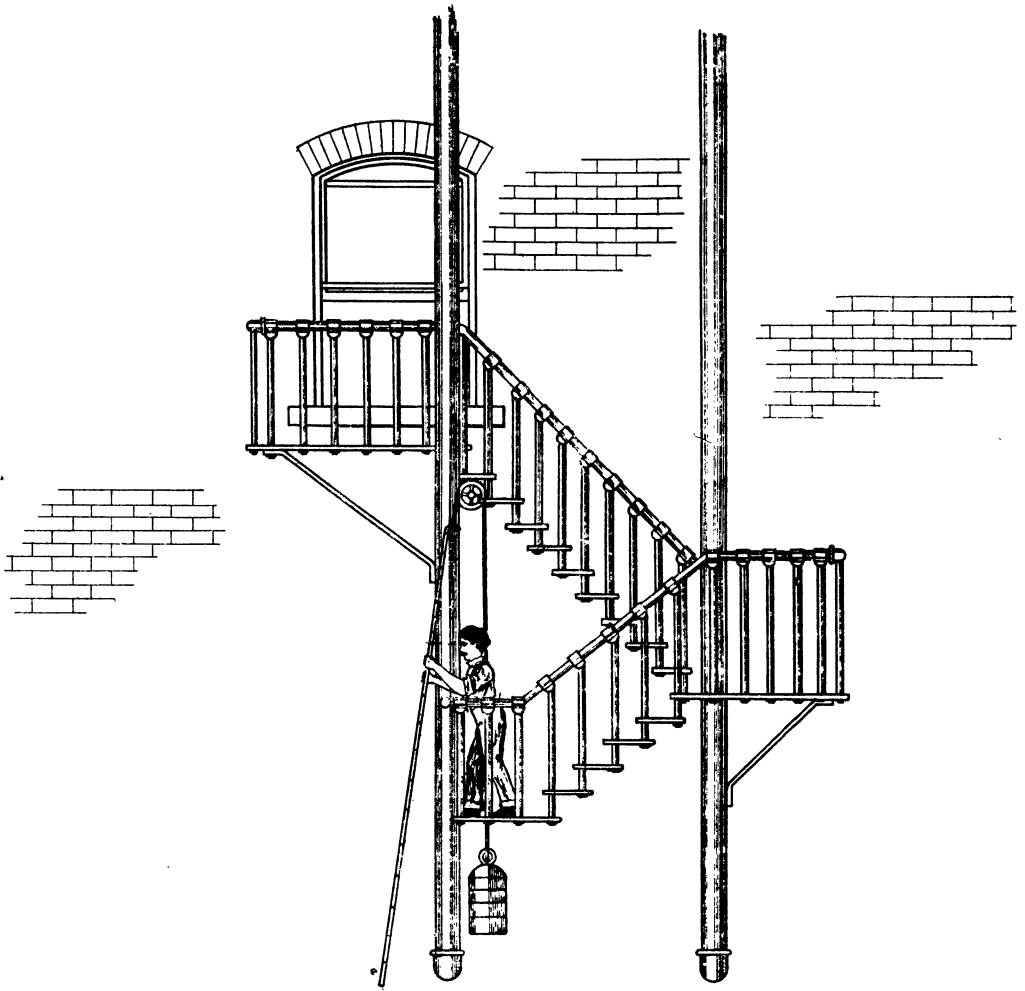
This man, although an old hand in the work of installing fire drills in school buildings, after several attempts to introduce a similar drill in our factory, was forced to concede that the building was so different from those to which he was accustomed, and the people so much older and less subservient to discipline, that he was unable to develop a fire drill which he felt would operate in an emergency.

#### *The Crux of the Problem a Defective Building:*

Driven back upon my own resources, I proceeded to work out a solution of the problem myself. I then found that in order to effect a safe, rapid egress of the occupants from the building, what amounted to practically a separate stairway from each floor had to be developed. When this was accomplished, we installed a fire drill without difficulty, which emptied the building in three minutes.

#### *The First Factory Fire Drill:*

This fire drill, actually taking the employees out of the building, was the first, as far as I know, that had been introduced into a factory. Naturally it created considerable comment. Newspaper and magazine articles described it, and many factory managers from all over the country wrote to me about it and visited me to see it.



A COUNTER-BALANCED DROP LADDER.

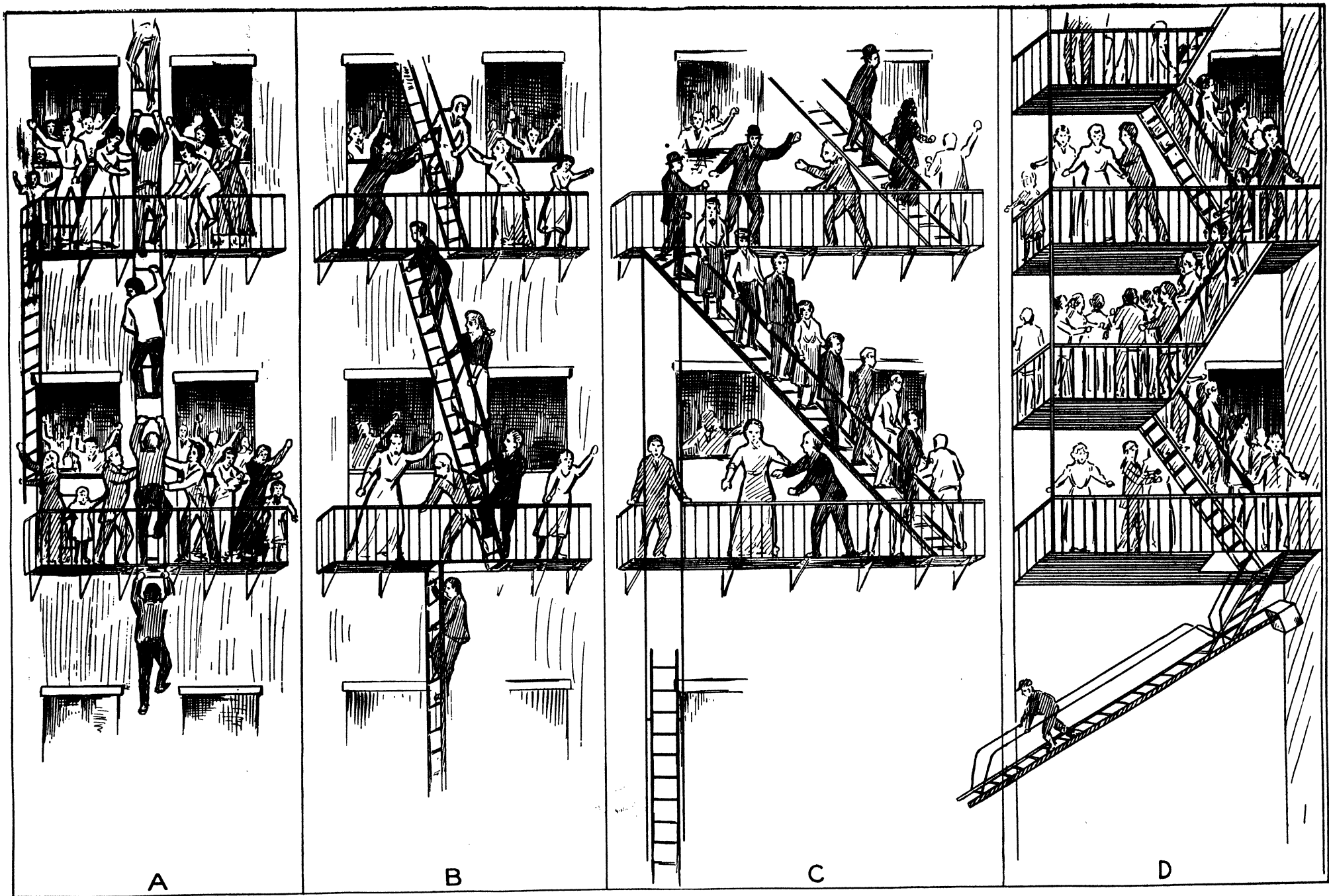
There are thousands of fire escapes which depend upon a "drop ladder" for the connection between the lowest balcony of the fire escape and the ground. Many of these ladders are hung out of reach or are taken away altogether. Almost all are too heavy to be handled in an emergency.

By counter-balancing them, using a chain, over a pulley on a brass shaft, to prevent rusting, the ladder can be kept in place and a child can lower it.









A COMPARISON OF THE CAPACITY OF DIFFERENT TYPES OF FIRE ESCAPES.

A A straight ladder fire escape, capacity 2 per floor.

B Inclined ladder fire escape, capacity 4 per floor.

C Straight stairway, 22 in. wide, capacity 12 per floor.

D Mezzanine platform stairs, 44 inches wide, with cantilever steps to ground, capacity 24 per floor.

When more than these numbers try to crowd in they form a jam and stop the flow downward altogether.



*All Factories Deficient in Stairway Facilities:*

As all the people who tried to introduce similar fire drills into their factories experienced the same difficulties as I had, many of them invited me to assist them in the installations. It was in this work that I began to realize that buildings occupied by many people on each floor are universally deficient in stairways. This condition has come about by the gradual growth of industry. Small factories had increased the number of their employees and added extensions to their buildings to accommodate them, but provided no additional stairways.

Architects and builders had blindly followed precedent, without taking cognizance of ample and frequent demonstrations of the weakness of their designs. Where fires had occurred and people had been burned up or had jumped from windows, the exit facilities had been augmented by the addition of outside fire-escapes, often merely ropes or ladders of the most elementary nature. The latter were simply crude make-shifts to supply a remedy for the deficiency in exit facilities which was felt to exist.

*Architects and Builders, Instead of Eliminating the Cause, Worked at the Effect:*

Architects and builders, however, instead of recognizing this defect in their building design, continued to blindly follow the lines which they saw developing. They still designed their buildings with inadequate interior stairways and exit facilities, and then proceeded to develop this outside fire escape into a permanent feature. The contracted space in which many of these fire-escapes had to be installed, and the tendency to cut the latter off some distance from the ground to prevent their being used for entrance by burglars, made their value as an exit facility extremely low; and yet these things were done in the face of repeated instances of fires burning up the people on these so-called "fire escapes," as well as the fire escapes themselves. (See Sketch I.) So that it was evident that the name of the latter was a misnomer, and that they were, on the contrary, veritable *fire traps*. (See Sketch II.)

Since these early experiences I have been engaged in the work of my profession of industrial engineering, developing the effi-

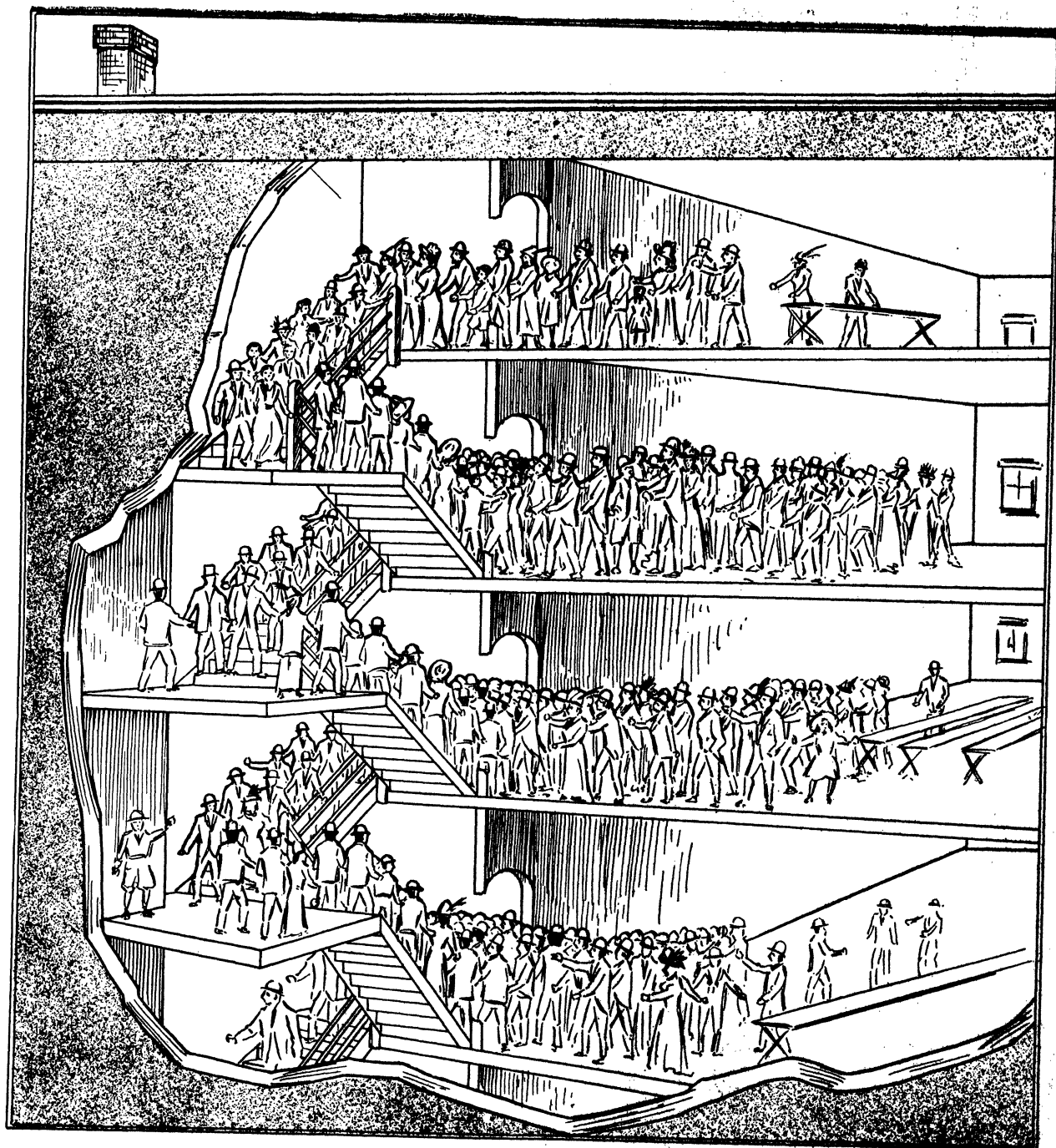
ciency of working organizations, and in this work I have rarely found a factory building so designed as to provide for its occupants a safe means of escape in case of fire.

*An Actual Test is Necessary to Prove Efficacy:*

This condition of affairs has come about from the failure of architects to test out their designs to see if they actually will serve the purpose for which they were intended. Never having been required to design buildings which would be emptiable in a specified time, their buildings are unemptiable under emergency demands. Had they tested their buildings to see if they would rapidly empty themselves in an emergency, they would have discovered, as I did when I applied such a test, that a stair-well has a definite and very limited capacity. It is simply a tube to which each floor is connected, and when these floors try to empty their contents simultaneously into it, it will accommodate only a definite number of people from each. Should any more try to crowd in, they jam it and the flow downward is arrested. (See Sketch III.) The reason for this jam is that the irregular shaped bodies of the people interlock and the friction of their clothing aids the wedging action so that there is an actual arch formed across the stairs, and the greater the pressure behind it the tighter it holds. (See Sketch IV.) This jamming is preventable to some extent by having no influx of people to a stairwell except at its top. I have been able to make emptiable many factory buildings by using this principle, and giving each floor its own individual stair-well. To make such a building safe, however, each floor should have two stairwells, and they should be as far apart as possible, and smokeproof, so that in case one should be cut off by a fire, the other would be available.

*The Limited Capacity of a Stair-Well:*

I have found, for instance, in the investigation which I have just made for your Commission, that the average loft building, with a height of story between floor and ceiling of from 10 to 12 feet, has a stair-well which if it has the minimum width of 3 feet allowed by the Building Code, will accommodate one person per foot of height per floor, and if it is 4 feet wide, just double



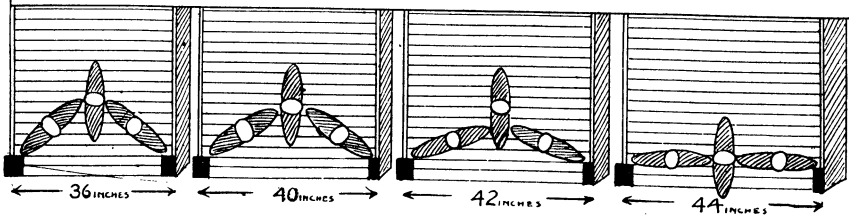
SKETCH E—STAIRWAY CONGESTION.

A stairway 12 feet high between floor and ceiling, 3 feet wide, will accommodate 12 people per floor. If the width is increased to 44 inches the capacity is doubled, viz: 24 people per floor.

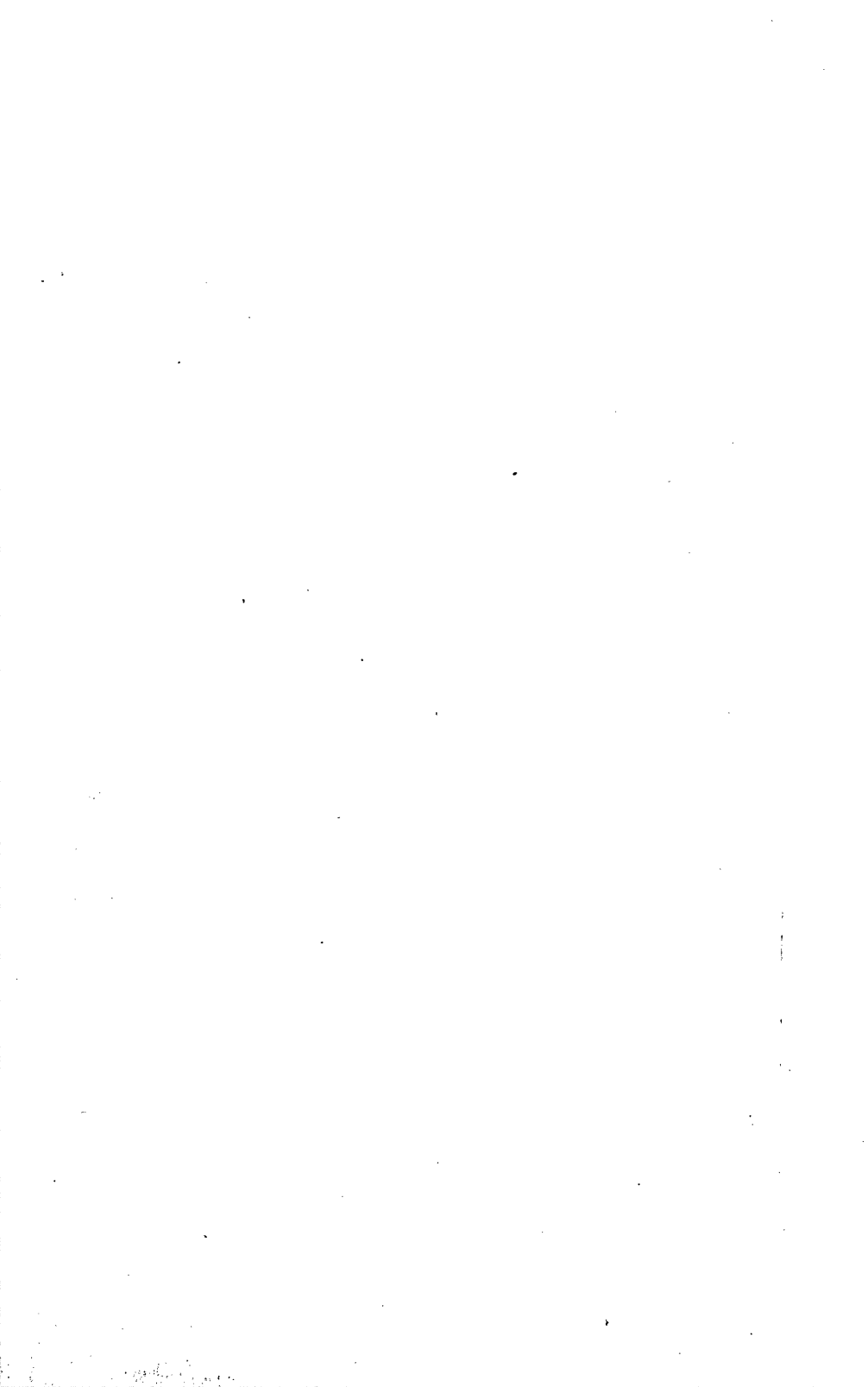
If there are more people per floor than these numbers they will collide on the landings and congestion will occur so that the downward movement practically ceases. All the occupants of each floor beyond the capacity of the stairways in case of fire, jump down or burn up. The fire wall offers a middle road to safety by a horizontal escape.



# IV



SKETCH F—The wider the stairs the flatter the arch and the less the tendency to jam tightly. Frequently the pressure of the jam becomes so great as to burst the rail, as in the case referred to on page 153.





that number. It will not be safe, then, to house more than 10 to 12 persons per floor in one case, and 20 to 24 in the other, unless more stair-wells are installed, or unless a separate stair-well is installed for each floor.

*Fire Drills Improperly Operated Are Conducive to Inefficiency:*

In the prosecution of my professional work I have had occasion to introduce fire drills in a large number of factories, whenever I found it necessary to safeguard the employees, and have naturally gained considerable experience in the best way to make such installations, so as not to cause waste of time and energy, both of which are expensive to employer and employee, and I have found that a fire drill which required the taking of people downstairs should be performed only at noon and quitting time at night, and that the factory should always be dismissed that way. In this way no time is wasted and the employees are not compelled to climb stairways to return to their work afterwards, which is very exhausting and tends to reduce their efficiency for a very appreciable time. Thus the people get to know the various exits and the avenues leading to them. But the essential value of the introduction of a fire drill lies in its function as a test of the adequacy of the exit facilities, and pointing out the obstructions in the way of reaching the exits that do exist.

*First Attempt at Legislation:*

So impressed did I become with the necessity for such a test to be applied to all buildings, that I set about making the fire drill compulsory by legislation. The first attempt in this direction was in 1905, through Mr. Jacob Erlich, a ladies' gown manufacturer who became imbued with the idea, and introduced a bill in the Legislature at Albany, through Assemblyman James C. Sheldon. The necessity for an appropriation for additional factory inspectors to secure its enforcement hampered its passage, and it never emerged from the committee to which it had been referred. The factory fire drill was not at that time recognized as a necessity, and the request for such legislation was not taken seriously.

*Second Attempt:*

As a result of an address which I gave on the subject before the annual convention of the New York City Federation of Women's Clubs, at the Hotel Astor, in 1908, an ordinance was introduced in the Board of Aldermen, by Alderman Mitchell, calling for a compulsory fire drill. This was referred to the Committee on Laws and Legislation and never was heard from afterwards.

*Third Attempt:*

After the Asch building fire a resolution to the same effect was made by Alderman Drescher, which was referred to the same committee, and died there.

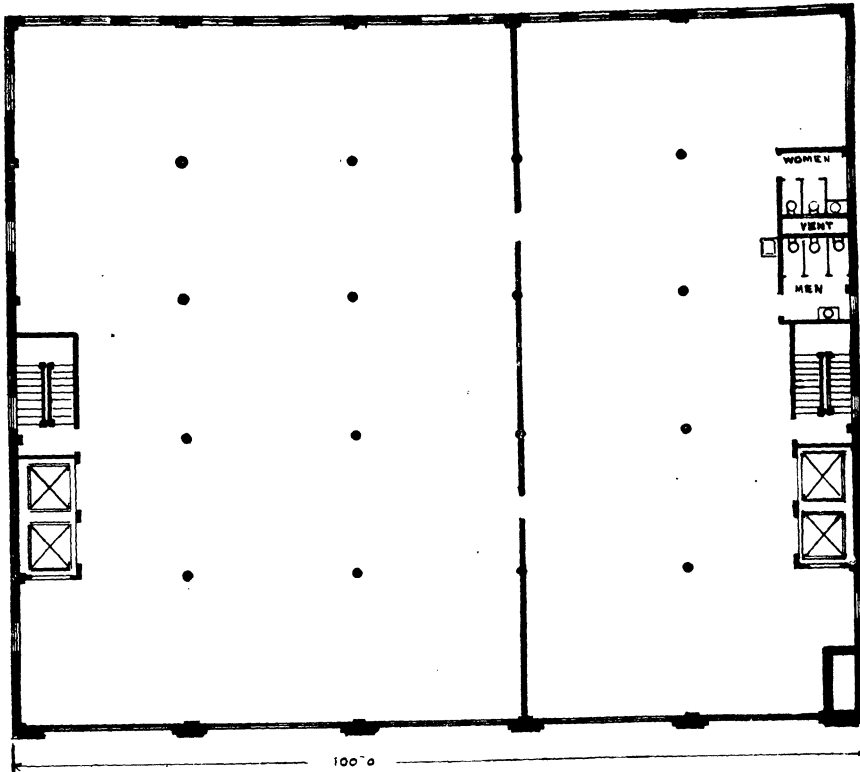
*Fourth Attempt:*

The Federation of Women's Clubs, discouraged by their failure to interest the Aldermen in the subject, proceeded shortly after the Newark fire in 1910 to introduce in the State Legislature, through Senator Thomas Cullen and Assemblyman Franklin Brooks, a bill which subsequently passed the Assembly, but after being referred to the Committee on Labor in the Senate, and being reported favorably, it was not acted upon.

*Fifth Attempt:*

This lack of action was perhaps due in part to the introduction of the so-called Herrick-McManus bill, drafted after the Asch building fire in 1910, by a number of civic organizations, of some of which I am a member, which also called for fire drills. This bill was the result of the aroused sentiment of the community in favor of factory fire drills, due in part to the publication in the press the day after this fire of my letter, sent some time before to the Triangle Waist Company, urging that I be allowed to install a fire drill in their factory. Under the public sentiment, and pushed by the civic organizations referred to, the bill passed both houses of the Legislature. Although it was the only relief in sight, the Mayor vetoed it.

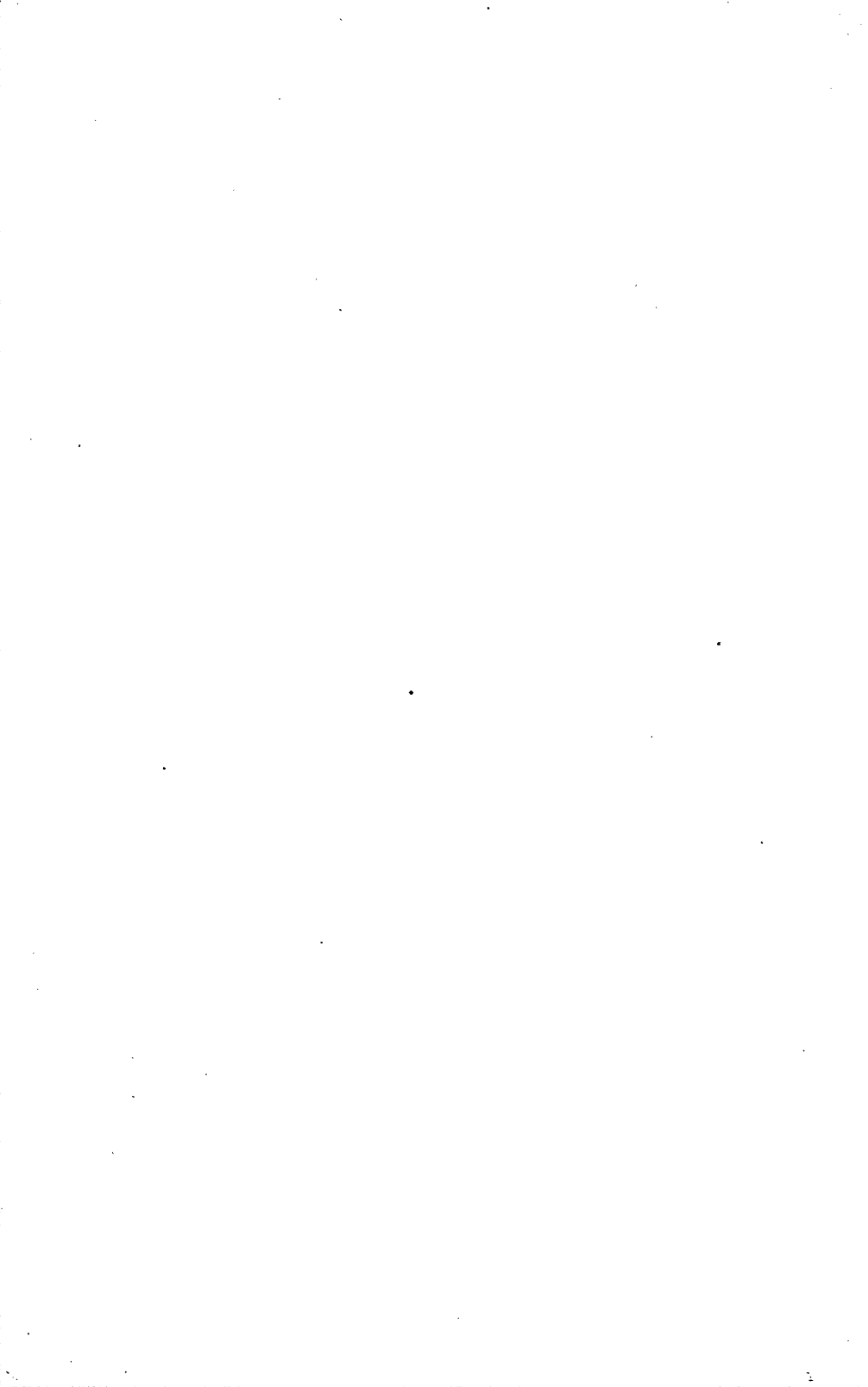
V



SKETCH G—A BISECTIONAL BUILDING.

Floor plan of typical loft building showing fire wall with doorways. The fire wall restricts the fire to one-half the building, allowing the occupants to escape horizontally from the fire as if they were on the ground floor.





*Sixth and Seventh Attempts Successful in Other States:*

Meanwhile compulsory fire drill bills were passed in both New Jersey and Pennsylvania, the former through the initiative of the Commissioner of Labor, with whom I collaborated, and the second through the Pennsylvania Consumers' League, aided by the New York State branch, of which I am the adviser in such matters.

*A Fire Drill is a Rapid Egress Test of a Building:*

As I developed proficiency in installing fire drills in factories, however, I became more and more impressed with the fact that stair-wells, from the fact that they have only a limited capacity, making them liable to become congested and jammed, and thus in themselves a source of injury to their users, should not be considered as a means of rapid egress such as would be necessary in case of a fire. We have evidence frequently presented from which this conclusion has been drawn, as for instance, the panic in the loft building, 548 Broadway, previously referred to, and another in a second story moving picture theatre at Cannonsburg, Pa., on May 5th last, where a flash in the film box started a rush for the short stairs, which, although they afforded a perfectly clear run to the street, became jammed, and 26 were killed, 25 seriously injured, and 30 suffered from minor hurts.

*The Fire Wall a Safe Fire Escape:*

In casting about for some other method of escape from fire I have pressed into service the most natural and available means at my disposal, viz: a wall of substantial and fireproof construction, extending from cellar to roof, with doorways in it on each floor. In case of a fire on one side of this wall, the people on that side simply pass through the doorways, close the fireproof doors and are perfectly safe from the flames whose progress in that direction would be thus arrested. The principle involved here is similar to that of the cyclone cellar of the western home, or the collision bulkhead of the ocean steamer. It develops a "bisectational building" offering a horizontal instead of a vertical escape, making the fire drill unnecessary. (See Sketch V.)

*It is Not a New Device:*

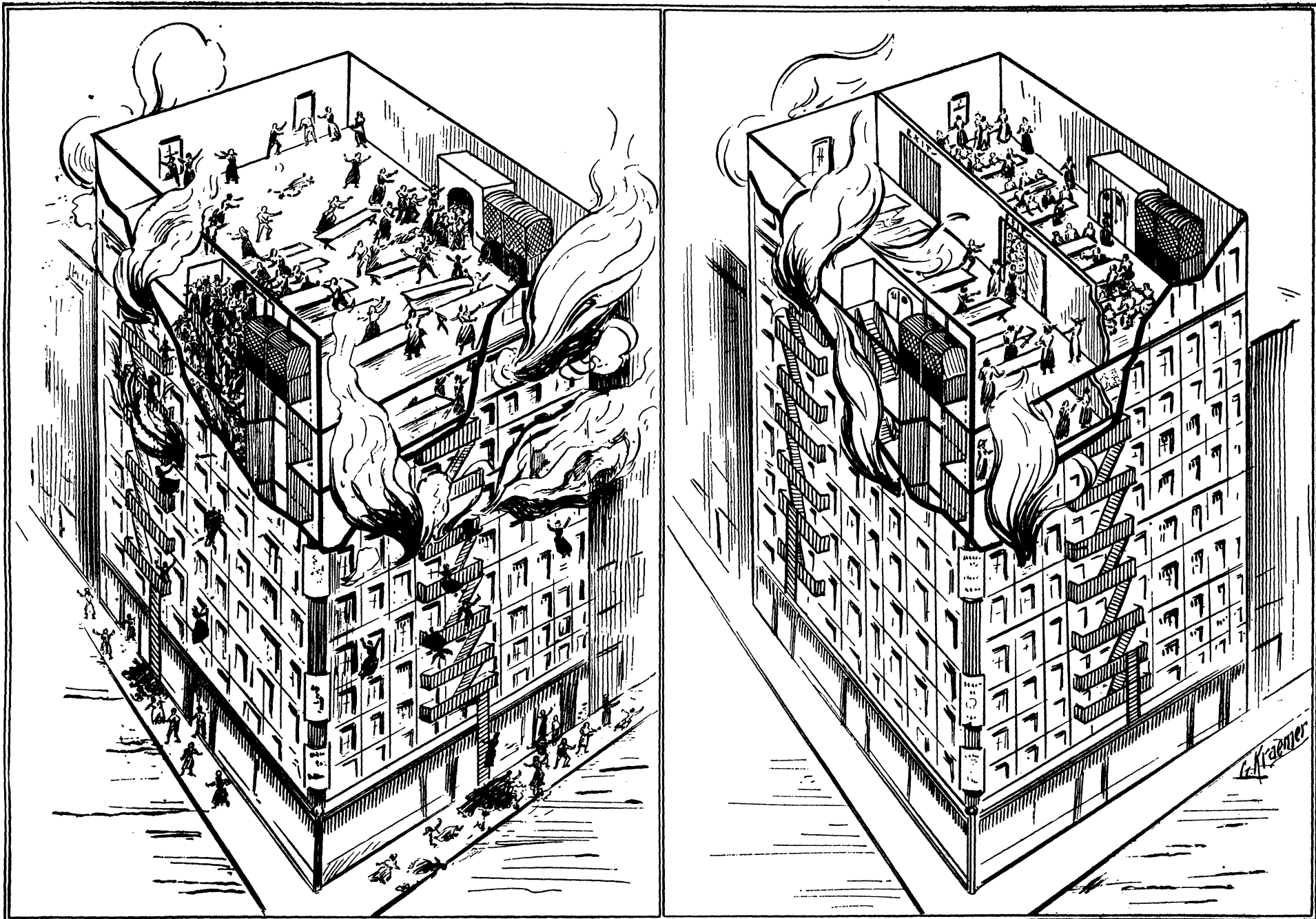
There is nothing new about this device. It already exists in buildings everywhere, in one form or another, and its value as a fire stop to protect property has long been known. Its availability as a fire-escape has not, however, been recognized, and it is this feature which I have advanced as affording the only means of safe escape from fire to the occupants of crowded floors. This is a new feature in architecture, as applicable to department stores, schools, theatres and residences as to factories.

*A Campaign of Education Started:*

Since my discovery of the inadequacy of the stairwell as a safe means of emergency exit from a crowded building, and my advocacy of the fire wall as a substitute, I have written and lectured much upon the subject in order to bring the situation to the attention of the public. This agitation resulted, among other things, in the appointment of your Commission as I have previously stated, and you were specifically instructed to investigate the situation and report upon it promptly in order to effect relief from a very serious situation.

*Witnesses at the Hearings Have Already Become Educated to Its Necessity:*

There has been overwhelming evidence presented at the hearings in condemnation of the so-called "fire-escape," and in favor of the fire wall. I offered in evidence when I was on the stand, letters from such authorities as Mr. P. Tecumseh Sherman and Hon. John Williams, former and present Commissioners of Labor, respectively, and Mr. A. D. F. Hamlin, Professor of Architecture at Columbia University, stating that the fire wall is the only safe type of fire-escape for buildings of the type and occupancy under consideration. Your Commission has been shown fire drills carried out in buildings without fire walls, and with them, and is therefore able from actual observation to itself determine their relative merits. (See Sketch VI.)



FIRE IN A TYPICAL NEW YORK LOFT BUILDING.

Hundreds of people on each floor jam the narrow stairs and fire escapes in panic. The elevators become jammed and on account of the smoke and flames are quickly put out of commission. Those who are not caught on the stairs either jump from windows or from the fire escapes when the fire reaches them.

Loft building with fire wall which confines the fire to one-half of the building. The occupants of that half merely pass through the doorways of the fire wall, close the doors after them, and are out of the reach of the fire. They do not have to go down stairs at all, but if they wish to do so the stairs and elevators will be found in normal condition without flames or smoke in them. The doors are fire proof and self-closing from the heat of the fire.





*The Three Alternative Fire-Escapes:*

Now that the limited capacity of the stairwell is recognized, there are three alternative methods presented to make buildings safe of occupancy as regards emergency exit.

1. Limit the number of people per floor to the capacity of existing stairwells, and make the latter smoke proof.
2. Increase the number of stairwells (making all smoke proof), to furnish exit facilities for the necessary or existing number of people per floor.
3. Install a fire wall continuous from cellar to roof so arranged as to practically bisect the building, having ample stairwells on each side.

In the latter case only may elevators be considered as exit facilities.

*A Proper Fire Drill Bill:*

I have statements from real estate men, builders and manufacturers that the fire wall is the best and cheapest of these alternatives. A proper fire drill bill should require that all buildings should be designed with one or other of the above alternative means of emptying them within a reasonable time. I have asked a great many people what they would consider a length of time beyond which they would consider it unreasonable to hold people inside of a burning building, and from their replies I have decided that the consensus of opinion would place 3 minutes as the limit.

*Strong Recommendations to the Legislature Should be Urged:*

Since the establishment of your Commission time has not stood still. The people of New York City have been restless for some action in the direction of improvement in fire-hazard conditions.

The Fifth Avenue Association which asked for your appointment naturally awaits the result of your investigation with much interest.

The only legislation so far enacted for the purpose of reliev-

ing the situation has been the Sullivan-Hoey Law developing a Fire Prevention Bureau in the Fire Department, and the evidences of its work as so far presented are not at all encouraging. Their efforts have so far been directed toward *fire escape* rather than *fire prevention*, and they show a decided disregard of modern methods by ordering what I have referred to in this report as "fire traps" on the fronts and backs of buildings all over the city. They have not been introducing fire-alarm signal systems in buildings, and yet these are absolutely necessary to advise their occupants of the existence of a fire in them.

It is recommended that the Board of Survey provided for in the Sullivan-Hoey Law be changed, and that its personnel consist of one member from the American Society of Civil Engineers and one member of the American Institute of Architects, each of these to be selected by the Chief of the Bureau of Fire Prevention from a list of ten names to be furnished by each of the organizations referred to. The third member of the Board of Survey to be either an architect, an engineer, or an attorney, to be selected by the owner of the premises to be surveyed.

Various organizations, civic and other, have been moving ahead doing this, that, and the other thing pending the recommendations of your Commission. Some of these actions are commendable, others not. There is a lamentable amount of ignorance on this subject which needs enlightenment.

It will behoove the Commission to make its recommendations known promptly, to meet the expectation of the public and to serve the purpose for which it was appointed.

Meanwhile, the dissemination of knowledge has gone on concerning my discovery of the limited capacity of a stairwell, as well as the remedy of the fire wall. The principle involved in the latter has been adopted in architecture.

Building Codes, not only in this, but other cities, are now introducing it without waiting for the recommendations of your Commission.

For the time and thought which they generously gave to the subject, I desire to express my obligations to the following gentlemen who were assigned by their respective organizations to act as a group of advisers in the formulating of this report:

Mr. Edward F. Croker, Ex-Chief Fire Department, Edward F. Croker Fire Prevention Bureau.

Mr. George B. Ford, McAneny Committee on Building Code.

Mr. A. D. F. Hamlin, Professor of Architecture, Columbia University.

Mr. Henry W. Hodge, Consulting Engineer.

Mr. C. L. Holden, N. Y. Chapter Amer. Inst. of Architects.

Mr. George T. Mortimer, V. P. United States Realty Co., Fifth Ave. Association.

Mr. Theophilus Parsons, Attorney-at-Law, New York Association for Labor Legislation.

Mr. C. B. J. Snyder, Sup't of Buildings, Board of Education.

Mr. F. J. T. Stewart, Sup't of the New York Board of Fire Underwriters.

I desire also to express my appreciation of the aid which has been given to me by my associate, Mr. A. L. A. Himmelwright, and my inspectors, Mr. E. B. Gowin and Mr. D. Ludins, for their faithful and painstaking work in securing and compiling data for my report, which I herewith respectfully submit.

Very truly yours,

(Signed) H. F. J. PORTER,

*Adviser on Fire Matters to the Commission.*

HON. ROBERT F. WAGNER, *Chairman N. Y. State Factory Investigating Commission, New York City, N. Y.:*

MY DEAR SIR:

I should like to supplement my report by a note which will be interesting as showing how recent experience has repeated that which I realized when I first became interested in the subject of the safe occupancy of buildings, some eight years ago.

I stated that in 1904, in an effort to develop a rapid egress of its occupants from a factory building in Pittsburg, I solicited the assistance of the Chief of the Fire Department, as well as of a public school principal, who was considered an expert in installing fire drills in that locality, and that both of these men acknowledged that they were utterly unable to devise a fire drill which would take the employees out of the building by the facilities then existing in it.

In the group of men which I recently invited to meet with me to consider means of effecting a rapid egress of their occupants from existing factory buildings here, were the ex-Chief of the Fire Department of this city, who has gone into the business of trying to introduce fire drills into these buildings to make them safe to their occupants, and the Superintendent of Buildings of the Board of Education, who designs the school buildings for fire drills, and both of these men stated at the meetings which they attended that they were totally unable to devise a fire drill which would empty the factory buildings which we had under consideration, as they are now designed.

Just as at Pittsburgh, changes had to be made in the stairways and exit facilities to make the factory building there emptiable under emergency conditions, in the same way must changes be made in the factory buildings of this and other cities of this State, to accomplish the same result.

It is squarely upon the shoulders of architects and builders that this situation has been allowed to develop, and they should be made to realize, by your recommendations for legislation calling for a rapid egress test with a three-minute limit, that their buildings should hereafter be built emergency emptiable, and then we

will not have to worry over the installation of either outside stairs of the fire-trap type, or of fire drills on stairs which are bound to be a source of accident from congestion in an emergency exit.

Buildings from which people can be extracted only by guides and cork-screw evolutions on inadequate stairs, whether on the inside or on the outside, should eventually become obsolete. School buildings should be no exception to the rule. School architects have been given *carte blanche* to design safe buildings and should be able to do so, and children, some of whom are cripples, others with heart and lung troubles, and many insufficiently nourished and clothed, should not be compelled to walk down several flights of stairs and go out into inclement weather and low temperatures without an opportunity to secure their wraps, and then have to climb the stairs again in these useless fire drills. The efficiency of these children at their studies may be impaired for the day, and their health may be permanently affected.

The public money is appropriated for teaching, not to operate fire drills, and the present waste of time and money in this direction alone, should be eliminated by the introduction of modern methods and the more efficient horizontal escape to safety through fire walls in case of fire.

I have referred to school buildings to point out how the tendency has been to work in the direction of fire escape instead of fire prevention, and to go into extreme elaboration in attacking the effect instead of working at the cause. This shows the inertia of large bodies towards divesting themselves of precedent and custom. It seems almost incomprehensible that an intelligent body of men such as composes the Board of Education of New York City should complacently continue to accept designs of emergency-unemptiable buildings, and then authorize the promulgation of such an elaborate series of fire drill directions, explaining what is necessary to do in order to get out of these buildings in an emergency, as the Superintendent of the Public Schools, Dr. Maxwell, has sent to you.

These buildings should be constructed like the new parts of the Singer and Metropolitan and the Woolworth buildings, so that, should a fire occur in any room, its occupants need merely be moved into the next room, the door closed, and then either put the fire

out or let it burn out. If a fire should occur in an adjoining building, all that should be necessary would be to pull down the asbestos curtains of the windows overlooking the blaze, to prevent the pupils' attention being distracted from their studies, and no attempt should be made to empty the whole building.

I hope your Commission will seize the opportunity to brush away traditions, such as the necessity for fire drills in all public schools, and the necessity for fire-escapes on the outside of all buildings. These are both relics of the past, and buildings should be built hereafter which do not require them. If you can get the public to see this situation in its right light, perhaps the architects may be made eventually to design their structures so that their occupants do not have to be dragged out of them by compulsory fire drills at unreasonable and inconvenient times.

Respectfully yours,

H. F. J. PORTER.

NEW YORK, *Jan. 31, 1912.*

## REPORT ON FIRE INSPECTION WORK, NEW YORK STATE FACTORY INVESTIGATION COMMISSION.

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In making a careful examination and study of the factory buildings of this city, by actual inspection, a number of dangerous and undesirable features and conditions were found.

### *Two Dangerous Types of Buildings:*

The investigations have resulted in the discovery of two types of buildings in which the conditions are particularly dangerous, and which constitute a most serious menace to the lives of the employees and other occupants of these buildings in case of fire.

Under the present building law, two classes of fireproof buildings are provided for: (1) When they exceed 150 feet in height, in which the law requires that the interior finish, such as the floor surfaces, trim, doors, and window frames and sash shall be of fireproof material; that is, hollow metal, metal-covered wood, or wood treated by some process to render it fireproof. (2) When less than 150 feet in height, in which the interior finish, trim, doors, window frames and sash, etc., may be of ordinary wood.

It is the fireproof loft building less than 150 feet (or approximately 12 stories) in height which is one of the two dangerous types of buildings above referred to. In all these so-called loft buildings light manufacturing is permitted, and in the case of a number of industries coming under this classification, great numbers of employees are crowded into these buildings irrespective of the exit facilities. In the loft buildings less than 150 feet in height there is, therefore, in addition to the danger from inadequate exits sufficient inflammable material in the floor finish, partitions, trim, etc., to cause fire of great intensity and of sufficient duration to destroy not only the lives of the occupants but also the entire contents of the building above the story in which the fire originates.

The extension ladders of the Fire Department are approximately 85 to 90 feet in length, and can reach only to about the 7th story of the average building. In case of fire or panic there is, therefore, a zone of great danger to life in these buildings less than 150 feet in height and comprising the 8th to the 12th stories, inclusive.

The Asch Building at Washington and Green streets was an example of this class of buildings, and that fire occurred in the danger zone herein indicated. Persons occupying these buildings above the seventh floor are in imminent danger, and prompt action for the immediate protection of persons in this danger zone is most urgent and necessary. It is strongly recommended that combustible trim, floor finish, window frames and sash, etc., be prohibited in new fire proof buildings over 85 feet in height.

The other dangerous type of building referred to is the old style non-fireproof, converted residence or tenement house, usually five or six stories in height, and provided with a single wooden stairway for the exit of its occupants. A fire occurring in the stairway in any of the lower stories of these buildings would seriously endanger the lives of many of the occupants, depending upon the promptness of the Fire Department in reaching the building in time to save their lives. Nearly all of these buildings have fire-escapes in the front or rear, but experience has shown that fire-escapes without the assistance of firemen have very little value as means of exit from buildings in case of fire, especially where the occupants consist largely of women and girls. (See Sketch II.) This type of building is exceedingly dangerous in case of fire, and material changes will be necessary to make them safe and satisfactory from the standpoint of fire danger. It is suggested that another stairway be required or that these buildings be provided with fireproof stairways and fireproof stair halls enclosed by substantial fireproof walls or partitions, or a fire tower be constructed in an adjacent court or the rear yard of these buildings, if their use for factory purposes is to be continued.

#### *Other Dangerous Features of Loft Buildings:*

In addition to the two particularly dangerous types of buildings referred to above, a number of undesirable conditions were found to exist in the great majority of loft and factory buildings inspected, as follows:

(1) *Insufficient Exit Facilities.*—In nearly every building inspected, including the most recent and modern lofts, the exit facilities were found inadequate. Experience has shown that an average stairway, for each 22 inches in width, has a capacity limited



to about 12 persons per story. The number of persons or occupants in the factory buildings in every case exceeded the capacity of the stairways in some of the stories, and in case of fire the lives of the excess number in these stories would be in jeopardy, as it would be impossible for them to make their escape in time to save their lives. Of 159 buildings inspected the exit facilities in 62 were found to be faulty, in 2 obstructed and in 23 dangerous.

(2) *Exits Obstructed by Temporary Partitions.*—In nearly all the loft buildings temporary partitions 6 to 7 ft. high have generally been erected around the stairway and elevator doors on each floor, forming a passage or vestibule in front of the exits. In some cases the space between the stairway and elevator doors was as small as three feet, but in most cases the space was 4 ft. to 6 ft. in width. Sliding doors in these temporary partitions admit the occupants to the vestibule and thence to the stairways and elevators. Very frequently cases and piles of stock and supplies are massed about these partitions, often restricting the size of the openings and impeding and preventing the sliding doors from operating easily. In many cases the total width of the openings of the sliding doors was very much less than the total width of the exit doors. It was claimed by the tenants that these partitions were necessary for business or economical reasons, as a barrier to sneak thieves, and in order to enable the inspectors to properly watch the employes as they came in and passed out from work each day.

Temporary board partitions, or "shop partitions," as they are sometimes known, are put up indiscriminately by tenants to enclose stock and supply rooms, designing rooms, etc., and without any consideration as to the restriction of light and ventilation, etc. These partitions are often located in disadvantageous positions by inexperienced foremen and superintendents, so that they not only hinder the business of the tenants but make conditions dangerous for the employees in case of fire. It is recommended that some regulations be enacted prohibiting the use of combustible materials for shop partitions in fireproof buildings, and that the location and the arrangement of the partitions be subject to the approval of the Building Department or some bureau having jurisdiction before

permission is given to erect them. Out of 109 buildings in which shop partitions were found, only in 42 were the partitions fairly well arranged, while in 48 the arrangement of the partitions was faulty, resulting in the obstruction of light or ventilation, or both, and in 19 the arrangement of the partitions was such as to delay employees in reaching the exits, favoring panic and thus endangering life.

(3) *Congested Conditions.*—In numerous buildings the work tables, merchandise, stock, and even the workers were crowded together so as to make it impossible for the employees to move about with freedom. Large piles of merchandise and stock also interfered with the light and air so that there is generally improper light and ventilation where these congested conditions exist.

(4) *Bad Arrangement.*—The arrangement of tables, merchandise, etc., was often such that the aisles between the tables had a direction at right angles to the exits, with no intermediate aisles. These aisles in most cases were too small or narrow to admit of easy passage. In time of fire or panic such conditions would prevent the occupants from reaching the exits promptly.

(5) *Neglected Fire Appliances.*—Only in a few cases, even in the most modern loft buildings, have chemical fire extinguishers been installed. In most cases, fire buckets or tanks were found, but these were generally in a bad condition. Instead of the fire buckets being in their regular racks and kept filled with water, they were usually found hanging underneath the cutting or pressing tables with varying quantities of water, but generally less than half full and being used by the workmen in connection with their regular work. Fire tanks of more than 15 gallons capacity are generally to be preferred in manufacturing establishments for the reason that they cannot so readily be adapted for other purposes. Of 159 buildings inspected, fire appliances were found in 149 buildings, and in 34 of these they were neglected and not in suitable condition for use.

(6) *Rubbish, Cuttings, etc.*—In many industries, notably in the manufacturing of clothing, there are large quantities of cuttings, scraps, etc., which result from the routine work, and these

are generally brushed off of the tables and scattered over the floors. In some of the larger establishments one or two persons are especially detailed to gather such cuttings and rubbish and keep the shop clean. In smaller places the work of collecting the rubbish is performed in the morning and in the late afternoon. During the middle of the day such rubbish is, therefore, liable to accumulate in considerable quantities, and become a menace to safety. It is believed that much of the danger from this source could be eliminated by requiring metal fireproof receptacles for such rubbish, and that it be collected constantly during working hours by a sufficient number of persons to keep the premises clean, the waste, scrap, rubbish, etc., to be required to be removed from the building at the end of each working day.

(7) *Smoking*.—One of the most frequent causes of fire is smoking. In some places signs are posted prohibiting smoking, and in nearly all cases smoking is prohibited by verbal instructions. Nevertheless, the inspectors found considerable smoking going on in nearly all the buildings visited. Frequently the proprietor or superintendent would be smoking while making the rounds of the establishment with the inspectors, and the smoking employees seeing them approach, would sometimes throw a lighted cigarette underneath the tables and in corners where rubbish and scraps might easily have started a blaze.

(8) *Inflammable Materials and Supplies*.—The establishments manufacturing inflammable goods such as celluloid, etc., should be controlled by special regulations and should be prohibited from continuing within the city limits unless special safeguards and regulations are provided. Such concerns should be required to provide fireproof supply rooms, and fireproof receptacles for rubbish, and should be permitted to take from the supply rooms only sufficient raw material to last for certain safe periods of time in the work-rooms. Such concerns should be permitted only in detached or separate buildings with incombustible floor finish and trim, metal work tables, furniture, etc.

(9) *Fire Drills*.—Of 159 buildings inspected, fire drills have been attempted in only 18, and in 4 of these the drills were ineffi-

cient and unsatisfactory. Fire drills when installed by inexperienced persons frequently have little or no value. In some cases the occupants of a story are drilled simply to march to the exits, and no provision is made in case fire should occur at or near one of the exits, which would require an immediate modification of the drill. Such fire drills in buildings with inadequate exits are useless and a waste of time, as it would be impossible to get the occupants out of the building or to safety in case of a fire.

On the other hand, when the drills are installed by competent persons and suitable exit facilities are provided, proper fire alarm signals introduced, fire-fighting brigades organized, and fire-extinguishing appliances available, the fire drills have real value and will prove successful and satisfactory in case of an actual fire.

In buildings with fire walls as defined in the recommendations submitted herewith, fire drills would become so simple that any intelligent person could install and supervise them, while the time required for their execution would be limited to only a few minutes.

(10) *Fire Escapes*.—In 159 buildings inspected all had fire-escapes but seven. Ninety were of the stairway type, 52 of the sloping ladder type, and 10 of the vertical ladder type. Of these, 38 were faulty either in design or construction, and 49 had dangerous and unsatisfactory ground connections or exits. In nearly every case the fire-escape was located in a position where it would be exposed to flames in case of fire.

Experience has shown that the ordinary fire-escape furnishes a most unreliable and unsatisfactory means of escape. They have proved to be much more useful to the firemen in fighting fires than to persons seeking escape from fire. When the flames burst through windows underneath the fire-escape, as is often the case, escape is cut off and the fire-escape itself is destroyed and rendered useless by the heat. It is now generally conceded by experts and others who have studied the fire problem, that the outside fire-escape as now furnished has very little value for the purpose intended; that a more reliable means of escape should be provided; and that the requirement and use of fire-escapes in the future should be discouraged.

(11) *Stand Pipes*.—These were found installed in 58 buildings of those inspected. Stand pipes with proper water supply and

street connections for fire engines are a valuable adjunct of the fire-fighting equipment, and should be required in all factory buildings over seven stories or 85 feet in height.

(12) *Automatic Sprinklers*.—Automatic sprinkler systems were installed in 45 buildings of those inspected. It is believed that the sprinkler system where properly installed will in many cases extinguish fire in its incipency, and in most cases will retard its spread, affording more time for the escape of persons to safety and preventing the fire from gaining material headway until the arrival of the firemen. They should be required in all non-fireproof factory buildings occupied by more than 200 persons above the first story, and exceeding three stories or 40 feet in height. In fireproof buildings with window openings protected with approved fireproof frames, sash and glass, sprinkler systems are more useful and valuable as a protection to property than to life.

(13) *Fire Walls*.—The principle of the fire wall is rapidly being recognized by the fire experts and the insurance and underwriting interests as the most general and satisfactory solution of the danger to life in the factory buildings. It is applicable to all factory buildings, and can be adapted to department stores, theatres, and all other buildings where large numbers of persons assemble. Besides being a safe and effective means of protecting life, it is equally desirable from the standpoint of preventing large property losses, and for the latter reason is advocated by the insurance and underwriting interests.

In 159 buildings, fire walls were found in 35 and where used and understood, caused a feeling of security and safety to the employees not found in other buildings.

It is recommended that fire walls should be required in every future factory building over seven stories or 85 feet in height, and which is occupied by more than 50 persons above the first story.

#### *Violations of the Law:*

While engaged in the work of inspection which extended over a period of two months, the inspectors found the following violations of law:

- 13 violations in respect to stairways.
- 1 violation in respect to stairway enclosures.
- 105 violations in respect to doors opening in.
- 88 violations in respect to fire-escapes.
- 34 violations in respect to fire appliances.
- 1 violation in respect to passenger elevators.

#### IN GENERAL.

The foregoing are but a few of the most important facts and conditions which should receive prompt consideration at the hands of the Commission. Numerous other undesirable conditions were also found, but the short time and the insufficient appropriation for this work has necessarily limited the amount and scope of the inspection work.

From the standpoint of the fire problem, it is believed that the work of the Commission naturally divides itself into two parts:

(1) Recommendations for the immediate correction of the dangerous and undesirable conditions in existing buildings; (2) Recommendations with reference to the construction of new buildings which will eliminate the undesirable and dangerous conditions found in present buildings.

It is believed that the most practical way in which the Commission can obtain the desired results with the least delay is (1) to secure legislation forthwith incorporating the recommendations of the Commission in respect to existing buildings and including the recommendations herewith submitted; and (2) that the Commission recommend the appointment of a board of competent experts to draft a State Building Code, in which shall be incorporated the recommendations of the Commission, including the recommendations herewith submitted with respect to new buildings, said code to govern the construction of all new buildings erected in the State of New York in the future.

Treating the fire problem in the manner already referred to, herewith are submitted two sets of detailed recommendations, one referring to *existing buildings*, and the other to *new buildings*.

# RECOMMENDATIONS TO ELIMINATE THE DANGER TO LIFE FROM FIRE IN FACTORY AND OTHER BUILDINGS.

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## SYNOPSIS OF THE PROPOSED PLAN TO CORRECT THE DANGEROUS AND UNDESIRABLE CONDITIONS IN EXISTING BUILDINGS.

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Assuming that immediate relief is sought from existing conditions, it is necessary that any proposed remedy or plan will not conflict with the administration and jurisdiction of the different municipal bureaus as now constituted, and in order that the proposed plan may be practical and feasible in its fulfillment, the various steps and actions necessary must be in conformance with the regular routine methods of the bureaus and departments having jurisdiction.

A careful study has been made from the practical side of this problem as well as from the engineering and structural standpoints, while the owner's interest has also been kept constantly in mind. It is fully realized that the owners in many cases will be obliged to incur considerable expense in correcting the unsafe conditions, and in order that no unnecessary hardship may be imposed upon them, every proper and practicable alternative has been made optional, and in all these cases the expense has been kept at a minimum consistent with efficiency and good construction.

In general, the proposed remedy for existing buildings is as follows:

All buildings in which a large number of persons are employed, except theatres, tenement houses, hotels and office buildings, to be posted under the direction of the Municipal or State Bureaus, or officers having jurisdiction, the notices to specify the number of persons that may safely occupy each floor in every building. To guide the inspectors of the Municipal or State Bureaus, or other

officers having jurisdiction, carefully prepared definite rules, applicable to both fireproof and non-fireproof buildings, have been developed and submitted.

If any building is occupied on any story by more persons than is specified in the notice posted in said story, the owner and the tenants are both notified by the Municipal or State Bureaus, or other officers having jurisdiction, and ninety days time is given to either change the number of occupants in the said story or provide the following optional alternatives: Additional stairways, fire towers, fire walls (or fire-wall principle; cutting through openings in party walls between adjoining buildings, providing bridges to other buildings), or providing such other exits or making such other alterations, or introducing such safety devices as will enable all the occupants of any building to reach places of safety within three minutes after the fire-alarm signal sounds.

Except in the very highest type and completely equipped fireproof building, it is made compulsory that fire alarms and fire drills shall be installed. Fire drills to be installed as soon as the necessary exit facilities have been provided in each case.

Now, as to the practical side of the plan: When an owner receives a notice that his building is occupied in any story by more than the number of persons specified, his first move will be to call in his architect or an engineer to devise a remedy. In most cases there would be only a few stories in which there are more than the permitted number of persons. In order that the owner may retain his tenants, some provision will have to be made to take care of the excess number of occupants in these stories. As soon as a plan is decided upon, drawings are made and submitted to Municipal or State Bureaus or other officers having jurisdiction. If the proposed remedy meets with the approval of that bureau, the plans are then filed in the Building Department, and, if approved, a building permit obtained and the work carried on to completion in the regular manner.

In the case of the type of buildings occupied by more than fifty persons above the first story, with a single wooden stairway for the exit of its occupants, the proposed remedy requires a second stairway remote from the first, a fireproof stairway, or a fire



tower in a court or a rear yard of the building plot. Where this type of building is old and dilapidated, as is frequently the case, the owner will hesitate to expend the amount necessary to install a fireproof stairway. By providing the alternate of a fire tower, the latter could be constructed without interfering with the normal and ordinary use of the building and could be utilized subsequently as part of a plan for a new building, which it could serve as efficiently as the present building. The construction work would in all cases be under the jurisdiction of the Building Department, as already stated.

By this proposed plan the regularly practicing architects, engineers and contractors will perform the work in the usual manner, without requiring any special appropriation for the work by the State or the city, and thus bring about the desired results in a natural, effective and expeditious manner.

By the time that legislation embracing this subject can be realized, there will probably be sufficient inspectors available in the Municipal or State Bureaus' jurisdiction to inspect all the factory buildings in six weeks to two months time, and with three months time in which to make the alterations and comply with the provisions of the law, it is believed that four months approximately will be all the time necessary after the passage of the necessary law, to correct the existing conditions in factories and accomplish the work that the Commission was specially delegated to perform.

The proposed plan in regard to all existing factory buildings contemplates the following requirements in the treatment of the buildings, summarizing and recapitulating:

(1) All factory buildings to be posted, the notice giving the number of persons that may occupy each story. The number of persons to be determined according to the rules submitted.

(2) Buildings in which the occupants of each story do not exceed the number specified in the notice posted will require no changes or alterations (except 3).

(3) Non-fireproof buildings with a single stairway occupied by more than fifty persons above the first story will be required, after

ninety days from the date of the notice posted, to have another stairway remote from the existing one, or a fireproof stairway, or fire tower, or the total number of occupants reduced to less than fifty.

(4) In non-fireproof buildings with more than one stairway, and in all fireproof buildings which are occupied by more than fifty persons above the first floor, the following features will be required within ninety days from the date of the notice:

(a) That the number of persons in each story be reduced to the number specified in the notice posted.

(b) If more persons are to remain in any story than specified in the notice posted, additional stairways, fire walls, fireproof connections to adjacent or nearby structures or other exit facilities or safety appliances shall be provided, subject to the approval of the Municipal or State Bureau or officers having jurisdiction.

(5) In all factory buildings occupied by more than fifty persons above the first story (excepting the very highest type of fireproof buildings, with incombustible floor surfaces, trim, doors, window frames and sash with wire glass, closing automatically, and with fire walls and automatic sprinklers), there will be required:

(a) A manual fire-alarm system.

(b) A compulsory fire drill within ninety days, and after the occupancy has been reduced to the number of persons posted or suitable exits have been provided to enable all the occupants to make their exit to places of safety within three minutes.

### EXISTING BUILDINGS.

#### *Posting:*

In every existing building in the State of New York used as a factory, workshop, store, school, college, institution, etc., which is regularly occupied by more than fifty persons above the first floor, except public schools, office buildings, hotels, and tenement houses, the Fire Commissioner or the Bureau of Fire Prevention in New York city, or the

Commissioner of Safety or other officer or bureau in other cities, or the proper state official outside of municipal limits — having proper jurisdiction and hereinafter designated, the municipal or state bureaus or officers having jurisdiction — shall cause to be posted, notices or placards specifying the number of persons that may occupy each floor in said building. One such notice is to be posted in a conspicuous place near the entrance door to each floor on the stairway side of each stairway enclosure, and at least two such notices in conspicuous places in each story in said building. If any story is occupied by more than one tenant, two such notices shall be posted in the space occupied by each tenant. All such notices to bear the date of the day when posted.

*Notification:*

In case more persons occupy any floor or floors than is specified in the said notices, the municipal or state bureaus or officers having jurisdiction, shall notify the tenant or tenants of said floor and the owner of the said building on a regular printed form for this purpose. The form shall include a further notice to the tenants and the owner that the number of occupants on said floor must be reduced to the number specified in the said notice posted; or such changes, alterations or additions made in the building; or such additional stairways, preferably a separate stairway for each floor, fire walls or fire towers introduced; or such openings into, or fireproof connections made with, adjoining or nearby structures; or such other exit facilities or safety devices provided — as may be necessary, subject to the approval of the municipal or state bureaus or officers having jurisdiction, to insure the reasonable safety of the persons occupying the premises by providing ways and means of exit in the manner and within the time as hereinafter specified; said notice to be complied with, or said additional exit facilities, etc., to be provided within 90 days after the date of the said notice.

*Buildings with a Single Stairway:*

In every existing building occupied by more than fifty persons above the first floor and in which only one stairway is

provided for the exit of all its occupants, another stairway shall be provided remote from the existing one, or said stairway shall be made fireproof and shall be enclosed by fireproof walls or partitions; stair halls with fireproof floors, finish, doors, trim, etc., shall be also provided, all as elsewhere herein specified. Said stairway and enclosure shall extend to the roof, and in non-fireproof buildings, the enclosing walls of the stair halls shall extend at least three feet above the roof and be coped. Or a tower fire-escape or fire tower as herein recommended may be erected within the building or adjoining the building and extending into a rear or side court or yard, provided the space occupied by said fire tower does not exceed 25% of the yard or court area of the building lot.

*Fire Alarm System. Fire Drills:*

In every building which is occupied regularly by more than fifty persons above the first floor (except fireproof buildings, with approved fireproof window frames and sash (closing automatically) with wire glazing and equipped with fire walls and approved automatic sprinklers), there shall be installed, subject to the approval of the municipal or state bureaus or officers having jurisdiction, a manual fire-alarm system by which all the occupants of a building or all the occupants between fire walls and exterior walls of a building shall be instantly notified in case of fire. Said fire-alarm on each floor shall indicate the floor on which the fire exists.

In every such building there shall be installed a compulsory fire drill of all persons occupying the said building, to be operated at least once in every month. The fire drill shall conduct all the occupants of the building to safety either into fire towers, stairwells or stair halls with fireproof enclosure walls as herein provided, or through fire walls, or to the outside of the building. No building shall be deemed safe or as furnishing adequate exit facilities that requires more than three minutes for the exit to safety of all its occupants, as herein prescribed. The fire drills shall be installed as soon as the necessary exit facilities have been provided, and the said drill shall constitute the decisive test of the adequacy of the exit facilities of each building. The fire drill shall be subject to the approval of the municipal or state bureaus or officers having jurisdiction, and shall be witnessed,

timed and certified to by a delegated representative of said jurisdiction within one hundred days of the date of the original notice posted.

*Determination of the Number of Persons that May Safely Occupy any Story in Existing Buildings:*

The number of persons that may occupy any floor in any existing building is to be determined by the capacity of the stairways and exits, and the provisions of the State Labor Law, as follows:

**Non-Fireproof Buildings:** First floor or ground floor: One hundred persons for each 22 inches of clear width of openings of regular door exits; in case there is but a single exit, one-half the above number of persons. Second floor to and including the seventh floor, 12 persons per floor for every 18 inches of clear width of each stairway leading down from said floor, provided the height of the stories between finished floor levels is not less than ten feet; the clear width of the stairs to be measured from the wall to the center of the hand rail or from center to center of hand rails. Above the seventh floor one-half the number of persons per floor as in the floors below. If the story heights exceed ten feet between finished floor levels, the capacity of the stairs may be increased by one person for each 16 inches of additional story height for each 18 inches of width of stairway.

Fire towers or fireproof stairways enclosed in self-sustaining walls, eight inches or more in thickness, shall not be considered as having any greater capacity than other stairways of the same width.

Non-fireproof buildings with approved fire walls as herein recommended shall have a capacity per floor between fire walls of fifty persons for each 22 inches of width of clear openings in such walls.

**Fireproof Buildings:** The number of persons that may occupy the first or ground floor to be the same as in non-fireproof buildings. For all floors above the first, 12 persons for every 18 inches of width of each stairway, leading down, when the story heights are not less than ten feet. If there are stair halls enclosed by fireproof partitions as herein recommended the num-

ber of occupants may be increased by one person for each 3 square feet of floor area of such halls on each floor.

Fireproof buildings with fire walls as herein recommended shall have a capacity per floor between fire walls of 100 persons for each 22 inches of width of clear openings in such walls, plus 12 persons for every 18 inches of width of stairs leading down, when the story heights are not less than 10 feet; provided, however, that the clear spaces on each side of the said fire wall are of sufficient area to accommodate the occupants of an adjoining space in addition to its own occupants on the basis of at least 3 square feet of floor area per person.

In General: Outside fire-escapes and elevators are not to be considered in determining the number of persons that may occupy any floor in any building. In case there are winders in any stairs the capacity of the stairways shall be estimated at 10 per cent less for each winder, but the total deduction for winders shall in no case exceed 50 per cent of the capacity of the same width of stairs without winders.

Stairways steeper than herein provided shall have their capacities reduced 10 per cent for each 5 degrees that the pitch exceeds 45 degrees.

No provision herein is to be construed to legalize more persons to occupy any floor in any building than is permitted under the State Labor Law, which requires 250 cubic feet of space for each person.

Nothing in these recommendations is to be construed as applying to theatres, motion picture theatres or opera houses, which are elsewhere especially provided for, or to tenement houses which are especially provided for in the Tenement House Act.

## CODE FOR NEW BUILDINGS, ADDITIONS, ALTERATIONS, ETC.

## FIRE WALLS.

A fire wall shall be construed to be a wall constructed of common brick, porous terra cotta brick without cellular spaces, or reinforced Portland cement concrete, having at each floor level one or more openings closed or protected by fire doors as herein provided.

Fire walls shall in all cases be located so that at least one continuous stairway or fire tower, with an exit to the street (and where practicable one or more elevators), shall be on each side of the fire wall.

If a standard equipment of automatic sprinklers is installed throughout any building, the allowable floor area between fire walls may be greater by fifty per cent than those stated in this section.

*Non-Fireproof Buildings:*

In non-fireproof buildings, the said fire walls shall be at least twelve inches in thickness and shall extend continuously from the cellar floor through the entire building and to at least three feet from the roof, and be coped. If the fire wall is used as a bearing wall, the wood beams shall be beveled and shall not come nearer to each other or to the opposite sides of the fire wall than six inches in any case. No openings in said wall shall exceed 66 inches in width or 60 square feet in area, and no two openings in the same wall and at the same floor level shall be nearer than 40 feet center to center. Every opening in said fire wall shall be closed and protected by an approved standard fire door closing automatically on each side of the wall. A cement, stone, iron, or other incombustible floor finish shall be provided at every opening in the fire wall for the full thickness of said wall, so as to completely separate the woodwork of the floors on each side of the fire wall.

In every non-fireproof factory building hereafter erected, the floor area between fire walls shall not exceed the following: When

fronting on one street, 5,000 square feet; when fronting on two streets, 7,500 square feet; when fronting on three or more streets, 10,000 square feet.

### *Fireproof Buildings:*

In all fireproof buildings hereafter erected, the fire walls shall be not less than eight inches in thickness, and shall be superimposed one above the other from the cellar floor to the underside of the fireproof roof. Said fire walls shall be built of the same material and in the same manner as specified in non-fireproof buildings, except that the openings may be protected by approved metal covered wood doors hung on each side of said wall.

In the case of fireproof buildings with incombustible floor finish and with metal or metal covered window frames and sash (closing automatically, with wire glazing and metal or metal covered doors, trim, casings, etc.), the fire walls shall be of the same materials as specified in this section, but may be reduced to four inches in thickness, exclusive of plaster, and the openings protected by two hollow metal doors hung on each side or by one metal-covered wood door hung on either side. In these buildings, the fire walls need not necessarily be superimposed.

The floor area between fire walls in every fireproof factory building hereafter erected shall not exceed the following: When fronting on one street, 7,000 square feet; when fronting on two streets, 10,000 square feet; when fronting on three or more street, 12,500 square feet.

### INTERIOR STAIRS — TOWER FIRE ESCAPES.

#### *Non-Fireproof Buildings:*

In all non-fireproof buildings hereafter erected, the number of stairs in each story shall be regulated by the area of each story measured on the outside of the walls, except as hereinafter mentioned. All stairways shall be continuous from the roof to the ground floor level. Where more than one stairway is required, the stairs shall be as remote from each other as possible. When the ground floor area exceeds that of the floors above it, the number of stairs required shall be determined by the area of a typical floor of those above the ground floor.



All stairs shall be enclosed by walls not less than four inches in thickness.

The width of the stairs, landings, and platforms, shall in no case be less than forty-four inches from the wall to the center of the hand rail, or from center to center of parallel hand rails.

All stairs shall have treads and risers of uniform width and height throughout each flight, and the rise shall be not more than eight inches, and the tread exclusive of nosings not less than nine inches. There shall be no winders in any public stairway.

All stairs shall be provided with substantial banisters or railings and hand rails, all of which shall be securely fastened. Each flight of stairs in every story which exceeds a height of twelve feet in the clear, shall have a proper intermediate landing. The landings of stairs which have a straight run shall be placed approximately at the center portion thereof.

The space beneath every staircase shall be left entirely open and be kept free from incumbrance, except that the space between any first story staircase, from the foot of same to a point on the soffit, which is not more than six feet above the floor, may be surrounded by an enclosure which shall be without any openings.

A tower fire-escape or fire tower shall consist of a stairway completely enclosed from top to bottom by walls of brick, masonry, or Portland cement concrete not less than twelve inches thick. The tower shall extend from the sidewalk, court, or yard level to the roof, and the walls of the tower shall extend high enough above the roof to form a bulkhead. Fire towers may be either inside or outside of the building, but there shall be no opening in any wall separating the tower fire escape from the building. There shall be access to every tower fire escape from every story of the building by means of outside balconies of steel, iron, or masonry. Every balcony shall be at least three feet eight inches wide in the clear, and shall be provided with a substantial, solid and fireproof floor, and fireproof wall railing not less than three feet or more than five feet in height. Access to the balcony from the building and to the fire tower from the balcony shall be by hollow metal or metal-covered wood doors, jambs and casings, with wired glass where glass is used. The sills of these doors shall be not more than four inches above the

floor of the building, the floor of the balcony, and the landing in the fire tower. The said doors shall be self-closing, at least three feet wide and swing outward on the balcony and inward from the balcony to the fire tower and shall be provided with locks or latches with visible fastenings requiring no keys to open them in passing from the building into the fire tower. At every doorway leading to a balcony, the words "Fire Tower Exit" shall be marked in legible letters not less than eight inches high, and at times when artificial lighting is necessary, a red light shall be provided to indicate each such exit. The landings in the fire tower shall be of such width that the doors opening into the tower shall not reduce the free passageway of the landings so as to be less than the width of the stairs.

Stairways of the fire towers shall comply with the requirements of this section for stairways in fireproof buildings. There shall be a direct exit from every tower to the roof and to the sidewalk, or through a fireproof passage or tunnel to the sidewalk. Said passageway shall be not less than three feet eight inches wide and six feet six inches high and without steps, all changes in level being overcome by grades.

At each story every tower fire escape shall be provided with natural light either by suitable self-closing windows of wired glass in metal frames or through wire glass panels in the doors. The area of glass shall be at least eight square feet at each story. There shall be, in addition, both in the tower fire-escape and in the passageway, if any, an electric lighting system, which shall furnish adequate light and be so arranged that the opening of any door into the tower shall cause all the electric lights to burn.

All balconies, stairways, passageways or tunnels, and all doors leading to fire tower balconies shall at all times be kept free from incumbrances and obstructions as required by the provisions of the State Labor Law relating to fire-escapes.

In every factory or workshop hereafter erected or altered, stairs and fire towers shall be provided as follows: (a) When the area does not exceed 2,500 square feet, there shall be at least one stairway; when the building is to be occupied by more than fifty persons above the first story, if only one stairway is provided it shall be of fireproof construction, with stair hall and

fireproof inclosure walls as specified elsewhere herein under *Stair Halls*; (b) When the area exceeds 2,500 square feet and does not exceed 5,000 square feet, there shall be at least two stairways; (c) When the area exceeds 5,000 square feet, and does not exceed 10,000 square feet, there shall be at least three stairways, and when the building is occupied above the first story by more than 500 persons each stairway shall not be less than five feet six inches in width; (d) When the area exceeds 10,000 square feet there shall be at least four stairways, and when the building is occupied above the first story by more than 1,000 persons each stairway shall be not less than five feet six inches in width. In case any of the above-mentioned buildings are more than three stories or 40 feet high, tower fire-escape will be required as follows: When the floor area above the ground floor equals 2,500 square feet or less, and if occupied above the first story by 200 persons or more, there shall be at least one tower fire-escape. When the area is between 2,500 square feet and 10,000 square feet, there shall be at least one tower fire-escape, and for every additional 10,000 square feet or fraction thereof, there shall be one additional tower fire-escape.

When the area of any floor exceeds the above requirements for four continuous lines of stairs, such additional stairways, tower fire-escapes, fire walls, or other means of exit and provisions for safety shall be provided as the Superintendent of Buildings, or other municipal or state bureaus or officers having jurisdiction shall direct.

If three or more flights of stairs are required, one tower fire-escape, erected in accordance with this section, shall be considered the equivalent of one interior flight of stairs as herein provided, but no open fire-escapes shall be accepted in lieu of such stairs.

#### *Fireproof Buildings:*

In every fireproof building hereafter erected, the entire interior stairways, including all platforms and landings within the enclosure walls, except the hand rails, shall be iron, steel, brick, terra cotta or other approved and equally fire-resisting materials. The width of the stairs, landings, and platforms and the width and height of

the treads and risers respectively shall be as provided in this section.

In case the treads, landings or platforms of any metal stairs are of slate, marble, or other stone, there shall be placed directly underneath of each tread, landing or platform for their entire length and width, a steel or wrought-iron plate solid, or with openings not exceeding four square inches in same, of adequate strength, but in no case less than one-eighth of an inch in thickness, and securely fastened to the stair strings with bolts or rivets, or to both the stair strings and the risers if the treads be more than three feet eight inches long. If the treads, landings and platforms are solidly supported for their entire length and width by masonry, concrete or other fireproof materials, steel supports shall not be required.

In every fireproof building hereafter erected, the number of interior stairs shall be as provided in this section for non-fireproof buildings, except that fire towers shall not be required. In fireproof buildings with fire walls, as herein specified, only one continuous stairway with exits to the roof and the street will be required in each space or section of the building between vertical fire walls, and exterior walls; but said stairways, landings and platforms shall be at least five feet six inches in width and built in accordance with this section.

#### STAIR HALLS; ENCLOSURES FOR STAIRWAYS AND ELEVATORS; DUMBWAITERS; LIGHT AND VENT SHAFTS.

##### *Stairways and Elevator Halls:*

In every factory building hereafter erected to be used or occupied by more than fifty persons above the first story, and which is exempted from tower fire-escapes or fire walls as herein elsewhere required, the stairways shall be of fireproof construction as provided herein under *Interior Stairs*, and said building shall have enclosed stair and elevator halls around the stairways and elevators in each story, including the first and cellar stories. The total areas of such halls shall not be less than three times the total floor opening areas of the stairway and elevator shafts in each story.

The enclosing walls of the stair and elevator halls and the door and window openings in the same shall be as provided under stairway and elevator enclosures.

Said stair and elevator halls shall have finished floor surfaces of stone, tiling, cement, rock asphalt, or other approved incombustible material.

*Stairways and Elevator Enclosures:*

All fireproof stairways and every elevator hereafter erected shall be enclosed in fireproof shafts throughout their entire height. The enclosing partitions shall be of brick, terra cotta brick without cellular spaces, or reinforced concrete, and supported by suitable foundations of masonry, concrete or steel.

The bottom of every elevator shaft and the top of such shaft, if it does not extend through the roof, shall be fireproof. If any elevator shaft in a non-fireproof building extends to the top floor, it shall be carried through the roof and three feet above it.

If not used as bearing walls, the partitions enclosing stairways and elevator shafts shall be not less than eight inches in thickness for the uppermost forty feet, and shall increase four inches in thickness for each additional forty feet or part thereof; or when wholly supported by suitable steel framing, at vertical intervals of not over twenty-four feet, they may be eight inches in thickness throughout their height, provided vertical steel structural members weighing not less than three pounds per lineal foot are framed at each corner of the shaft, and that in the case of elevator shafts containing more than one car, similar intermediate vertical members be framed opposite the divisions between the cars; the enclosing partitions in all cases to be thoroughly anchored to said vertical members; or in the case of fireproof buildings with incombustible floor surfaces, trim and finish, with supporting and vertical steel framing, and when built of materials all as herein specified, the enclosing partitions of stairways and elevators may be four inches thick.

The inside surfaces of all elevator shafts when finished shall be flush, smooth, and free from projecting sills, lintels, or off-sets.

The door openings through stairways and elevator enclosures in each story shall be provided with approved self-closing fireproof doors. Window openings in said enclosures shall open to the outer air, and shall be of approved hollow metal or metal-covered frames and automatically closing sash, with wired glass. Where elevator

enclosures extend through the roof of a building, the roof of the enclosures shall be of approved fireproof material with a skylight of at least three-quarters of the area of the shaft, the glass to be not more than one-eighth of an inch thick and protected above and below with strong wire netting set in iron frames; but wired glass shall not be used in skylights over elevator enclosures.

When the compartment containing the machinery for operating the elevator communicates with the elevator shaft, said compartment shall also be enclosed in fireproof partitions as required for the elevator shaft, and shall have standard fire doors.

*Enclosures for Dumbwaiters:*

All dumbwaiter shafts hereafter placed in any building, except shafts which do not extend more than one story above the cellar or basement floor in dwelling, shall be enclosed by walls of brick, reinforced concrete, terra cotta or other equally fireproof material at least four inches thick. Such walls or partitions shall rest upon masonry or concrete foundations or upon suitable steel framing.

Where the dumbwaiter shaft extends into the cellar or lowest story of a non-fireproof building, it shall be enclosed in that story with walls of masonry not less than eight inches thick.

The bottom of all dumbwaiter shafts shall be fireproof, and where such shaft does not extend through the roof, the top of the shaft shall be fireproof.

When dumbwaiter shafts extend through the roof, they shall extend at least three feet above the roof, and shall be covered with fireproof material, and have a metal frame skylight covering at least three-fourths the area of the shaft.

All openings in shaft walls shall be provided with self-closing standard metal doors, with metal jambs and trim.

*Light and Vent Shafts:*

In all buildings hereafter erected or altered, except frame buildings, the walls or partitions forming interior light or vent shafts shall be not less than four inches in thickness, exclusive of plaster. The walls of all light and vent shafts whether exterior or interior, shall be carried up not less than three feet above the level of the roof and shall be coped.

STANDPIPES; AUTOMATIC SPRINKLERS; FIRE SHUTTERS  
AND DOORS.*Standpipes and Fire Appliances:*

In every existing factory building exceeding 85 and not over one hundred and twenty-five feet in height, which is not provided with a three-inch or larger standpipe, and in all factory buildings hereafter erected exceeding 85 and not exceeding 125 feet in height, there shall be provided a vertical standpipe not less than four inches in diameter.

In every existing factory building exceeding 125 feet in height which is not provided with a three-inch or larger standpipe, and in all buildings hereafter erected exceeding 125 feet in height, there shall be provided a vertical standpipe not less than six inches in diameter, or two vertical standpipes not less than four inches in diameter.

All standpipes now erected or hereafter erected shall have on each floor in the stair hall, if practicable, a two and one-half inch hose connection, with hand valve, and upon an approved rack or reel, sufficient hose to reach any part of the floor. There shall be sufficient hose at the valve on the top floor to reach any part of the roof. Standpipes and fittings shall be of galvanized wrought iron or steel, or of brass, shall have screwed joints, and shall be able to safely withstand a water pressure of 300 pounds per square inch when installed and ready for service. Standpipes shall be located, constructed and arranged to the satisfaction of the municipal or state bureaus or officers having jurisdiction.

In buildings over 100 feet deep and fronting one or more streets there shall be a standpipe at each end of the building; and in buildings exceeding 5,000 square feet in area there shall be one standpipe for each stairway. Where two or more standpipes are required, they shall be connected at the base by pipes the size of the largest standpipes, so that the water from any source will supply all standpipes. Hangers and supports shall be of ample strength, and be securely braced to avoid vibration.

Hose shall be two and one-half inches in diameter and able to safely withstand a water pressure of 200 pounds per square inch. It shall be in fifty foot lengths, and have at each end a standard

coupling with the thread used by the Fire Department, and shall have at least a three-quarter inch standard nozzle. There shall be two hose spanners at each hose connection.

Every standpipe shall have at the street level a siamese connection with an outlet the same size as the standpipe. Each connection for hose shall have an area equal to one-half of the standpipes and the thread on the hose connections shall be that used by the Fire Department.

In every building hereafter erected each standpipe shall be carried up with each floor after the structure has reached a height of 85 feet. Each standpipe shall be fitted with an outside siamese connection in a proper and accessible place, and on each floor above the second floor regulation hose outfits shall be provided as the work progresses. The upper end of each riser shall be securely capped at all times except when work on the standpipe is actually in progress.

In each connecting pipe just inside the building, in a horizontal section, shall be placed a straightway check valve, but not a gate valve. A drip pipe and valve shall be placed between the check valve and the steamer connection. Besides the steamer connections, the standpipes may be supplied with water from the street mains at points where the pressure therein is sufficient, and if required by the Fire Commissioner or other municipal or state officer having jurisdiction, they shall be connected with an approved automatic fire pump with a capacity of not less than 500 gallons per minute, a suitable elevated tank or an approved pressure tank equipment of not less than 5,000 gallons capacity.

Where a standpipe is connected to a tank there shall be a straightway check valve in a horizontal section of pipe between the first hose outlet in the connecting pipe and tank. The tank shall be supplied by a separate pipe, and not through the standpipe.

Pumps which supply standpipes shall be placed not less than two feet above the floor level, and boilers which supply steam for such pumps shall be protected against the flooding of their fires to a level at least one foot above the general floor level. All electric wiring for fire pumps and elevators shall be so installed as to secure it against injury by fire.



In every building exceeding 85 feet in height at least one elevator shall at all times be in readiness for immediate use by the Fire Department.

All existing factory buildings, and those hereafter erected, which exceed 85 feet in height shall be provided with such wrenches, fire tanks and fire extinguishers, buckets, axes and pails as may be required by the Fire Department.

All valves, hose, tools and other appliances provided for in this section as required by the Fire Commissioner or other municipal or state officer having jurisdiction, shall be kept in perfect working order, and at least once a month the person in charge of the building shall make an inspection to make sure that they are in good working order and ready for immediate use by the Fire Department.

Plans showing location, size and connections, with duplicate descriptions of all standpipe installations, shall be furnished to the Fire Commissioner or other municipal or state officer having jurisdiction. These drawings must be to scale, and shall consist of such floor plans and sections as may be necessary, to show clearly all such work to be done, and must show all partitions, stairways, inclosures and elevator shafts. The work of installing a standpipe shall not be commenced or proceeded with until said drawings and descriptions, in detail, shall have been approved by the Fire Commissioner, or other municipal or state officer having jurisdiction. No modifications of the approved drawings and descriptions shall be made until after new plans and descriptions covering the proposed change or changes are similarly filed and approved.

#### *Automatic Sprinklers:*

In every non-fireproof factory building the height of which exceeds three stories or forty feet, which is to be occupied by more than 200 persons above the first story, and in every fireproof building which is to be occupied by more than 200 persons above the seventh story and which is not equipped with approved fireproof window frames and sash (closing automatically) with wired glass, incombustible floor finish, trim, etc., there shall be provided a complete equipment of automatic sprinklers, which shall be

satisfactory to the municipal or state bureaus or officers having jurisdiction, in each story and extending the full depth and breadth of the building. Said sprinkler pipes shall be connected with a pipe not less than four inches in diameter leading to the outside of building, and there provided with an approved siamese steamer connection, the latter to be installed under the requirements, and to be under the control of and for the use of the Fire Department. A suitable iron plate with raised letters shall be attached to the said steamer connection, or to the wall opposite it, reading "Automatic Sprinklers."

In every building used or occupied for business or manufacturing there shall be provided along the ceiling line of each story below the first story an equipment of automatic sprinklers which shall be satisfactory to the Fire Commissioner, or other municipal or State officer having jurisdiction. The inlets of these supply pipes shall be placed near the siamese connections for their standpipes. These supply pipes shall be fitted with a standard Fire Department connection. On the wall near each supply pipe or attached to said pipe shall be placed a suitable plate to read, "This pipe connects to automatic sprinklers in the cellar."

#### *Fire Shutters and Doors:*

Every factory with masonry walls, more than 25 feet in height shall have standard fire doors, blinds or shutters or their equivalent, as required in this section, on every exterior window and opening above the first floor, except on openings fronting on streets, which are more than thirty feet in width, or where no other building is within thirty feet of such opening.

Where an approved fireproof window frame and automatically closing sash glazed with wired glass is installed, fire shutters may be omitted.

At least one row of shutters vertically in every three vertical rows on the front window openings shall be so arranged that they can be readily opened from the outside.

In every fireproof factory building hereafter erected and regularly occupied by more than fifty persons above the first story, the window frames and sash shall be of metal or wood covered

with metal, the sash closing automatically and glazed with wire glass.

All windows or doors opening on fire escapes in all buildings hereafter erected shall be fireproof as provided in this section.

Shutters and their hinges shall be kept free from rust and corrosion, and kept well painted.

Rolling iron or steel shutters shall be carefully counter-balanced, and so arranged that they can be readily opened from the outside.

All buildings hereafter erected or altered, except those exempted in the first paragraph of this section, which have openings in interior walls, shall when required by the Superintendent of Buildings be provided with standard fire doors on both sides of the wall; such fire doors to have approved self-closing devices. All occupants of buildings shall close all exterior and interior fire doors and shutters at the close of each business day.

### GENERAL RECOMMENDATIONS.

It is recommended that all fireproof factory buildings exceeding 85 feet in height be required to have the floor surfaces of incombustible finish, and all doors, trim and interior finish of fireproof materials, all window frames and sash to be of metal or metal-covered wood, the sash to close automatically and be glazed with wire glass.

It is recommended that all industries whose product or raw materials are highly inflammable, such as celluloid, etc., be prohibited from occupying ordinary factory buildings. Concerns manufacturing such goods should be required to occupy separate or detached buildings, in which the following special features are provided: (1) Fireproof stock and supply rooms with approved fireproof doors and ventilation to the outside. (2) Fireproof receptacles for all waste and rubbish. (3) Metal or fireproof work tables. (4) Artificial light without exposed flames. (5) Hot water heating system. (6) Requirements prescribed by the proper jurisdictions permitting only a designated, limited quantity of inflammable materials or goods in the work room.

It is recommended that approved fire tanks of not less than 15 gallons capacity, with included buckets, be provided to comply with the requirements of the insurance and underwriting rules, instead of the ordinary fire buckets.

It is recommended that fireproof receptacles be required in every factory for all combustible scraps, cuttings, rubbish and other waste; and that it be made compulsory that a sufficient number of employees be detailed to collect such waste and keep the premises clean during the working hours, such waste and rubbish to be removed from the premises at the end of each working day.

It is recommended that firms and individuals be obliged to obtain a license from the proper bureau or jurisdiction, subject to such regulations as may be drafted by such bureau, before they are permitted to engage in business. Before such license shall be issued and before any premises can be occupied as a factory employing more than ten persons exclusive of the office employees, a complete detailed plan shall be filed and be approved by the municipal or state bureaus or officers having jurisdiction. Such plan shall be on a scale not smaller than one-quarter of an inch to the foot, and shall show the exact location and correct dimensions of all exits, machinery or other equipment, light fixtures, electric switchboard, work tables, permanent and temporary partitions, material and supply rooms, stock rooms, drying rooms, toilet rooms, hat and cloak rooms, shelving, fire appliances, desks and all other furniture except chairs or seats.

It is recommended that all new factory buildings intended to be occupied by more than fifty persons above the first floor be of fireproof construction.

It is recommended that smoking in factories in which the raw materials or products are of a combustible nature be made a crime punishable by law.

It is recommended that the sale of all ordinary matches be prohibited, and that safety matches only be permitted on sale in the state.

It is recommended that gasoline, naphtha, and other highly inflammable and volatile liquids be prohibited in factory build-

ings. Where non-inflammable substitutes are not practicable, limited quantities to be fixed by the proper jurisdiction, to be permitted in approved safety cans and under conditions to be prescribed by the Bureau of Fire Prevention, or other municipal or state bureaus or officers having jurisdiction.

Respectfully submitted,

H. F. J. PORTER,

*Adviser on Fire Matters to the Commission.*



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**APPENDIX III**

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**REPORT ON BAKERIES AND BAKERS  
IN NEW YORK CITY**

By GEORGE M. PRICE, M. D.

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# REPORT ON BAKERIES AND BAKERS IN NEW YORK CITY

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By GEORGE M. PRICE, M. D.

## PART FIRST.

### THE SANITARY INSPECTION OF 497 BAKERIES.

#### I.

Man does not live by bread alone, but it is his chief food and "staff of life." Of all the arts, that of bread making is the most ancient. Of all of the industries indispensable to human economy, not one is so important or so closely related to the health of the nation as that of making our "daily bread."

In spite of all this there is no industry that has achieved so little progress, or which is conducted under such unsanitary conditions, with processes so elementary and archaic, as the trade of bread baking.

The shocking revelations of "The Jungle" were necessary before belated reforms could be introduced in the meat packing trade. One hundred and forty-six victims perished in the Triangle fire before New York was aroused to the every-day menace from fires in loft buildings. The unsavory details of the manufacture of our daily bread must perhaps be made public before the long needed reforms in the trade can be secured.

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On April 18th, 1911, the Commissioner of Accounts of New York City, Mr. Raymond Fosdick, issued a report entitled "On the Sanitary Conditions of Bakeries in New York," the result of an inspection of one hundred and forty-five bakeries made in conjunction with the Consumers' League. (1).

Previous to the appearance of this report, a daily newspaper made an independent inspection of a number of bakeries in this city, and daily regaled the public with descriptions and photographs of the findings of its reporters.

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Note.—Numbers in parenthesis refer to the bibliography, page 238.

As this subject was undoubtedly within the jurisdiction of the State Factory Commission appointed "to investigate existing conditions under which manufacture is carried on as to matters affecting the health and safety of operatives, and of the general public," an investigation was undertaken to determine existing conditions and to recommend remedial legislation.

Accordingly, an inspection of 485 bakeries (497 individual shops) was made by our staff of inspectors.

The inspections were made chiefly between the hours of 8 and 12 P. M., although some visits were made during the earlier hours of the day. With the exception of six large factories, the bakeries inspected were all located in cellars.

The inspection of bakeries was confined to the cities of New York and Yonkers, more especially to the Boroughs of Manhattan, Brooklyn and the Bronx. Practically all sections of these boroughs were covered.

The International Bakers' Union and its locals in the city have closely co-operated with the Commission, and in a large number of cases sent their representatives to accompany our inspectors.

Besides the sanitary inspection of 497 bakeries, a staff of physicians engaged by the Commission made physical examinations of 800 bakers. These examinations were made during working hours, while our inspectors investigated the sanitary conditions of the shops. This report is therefore based on the results of the sanitary inspection of 497 bakeries, and upon the examination of 800 bakers.

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## II.

### BREAD MAKING A MUCH INVESTIGATED INDUSTRY.

Bread making has been investigated both in this country and abroad, perhaps more than any other industry.

In *England*, the agitation against unsanitary bakeries was begun by the Journeymen-bakers in the late fifties and early sixties of the last century. In the "Reports of the Bakery Trades in Ireland," issued in 1861, and "Reports Relating to the Grievances of the Journeymen-bakers," in England, in 1862,

these conditions are vividly described, and this report, says Marx, (2), "roused not the heart of the public, but its stomach." "Englishmen, well up in the Bible, knew well enough that man is commanded to eat his bread in the 'sweat of his brow,' but they did not know that they had to eat daily in their bread a certain quantity of human perspiration, mixed with the discharge of abscesses, cobwebs, black beetles, without counting alum, sand, and other agreeable ingredients."

While the two Commissions, the one in Ireland in 1861 and the other in England in 1862, were the first official bodies to investigate the bakery trades, attention was directed to this subject much earlier. W. A. Guy, in 1848, wrote a monograph on "The Evils of Night Work and Long Hours of Labor Among Bakers." (3).

Since the time of the two Commissions in the early sixties, a number of investigations were made by several non-official bodies, and all of them commented upon the unsanitary state of the bakeries and the abnormal conditions under which the bakers worked.

The most notable of these investigations was that conducted by the so-called *Lancet Special Commission* in London in 1889, the report of which was published in the "Lancet" in 1889 and 1890. (4).

The results of these investigations were also published later by Drs. Waldo and Walsh in a book entitled "Bread, Bake-Houses and Bacteria," to which further reference will be made. (5).

In 1894, the Medical Officer of Health, Shirly Murphy, issued a report on the "Sanitary Conditions of the Bakery Houses," which resulted in the "Factory Act" of 1895, prohibiting the location of bakeries in cellars, and providing strict regulations for the industry. (6).

In *Germany*, the agitation for the improvement of bakeries was due mainly to the efforts of the Bakers' Labor Unions, whose activities began in the late eighties of the last century.

In 1888, a voluntary investigation was made by a Committee of the Social Democratic Party. The results of this investigation are fully described by A. Bebel, in his book. (7).

In 1898, the results of another investigation undertaken by the Union bakers of Germany were published under the title of "Ein Nothschrei der Backerei-Arbeiter Deutschlands." (8).

This agitation has had for its practical result the law of March 4th, 1896.

In *France*, the miserable conditions of the bakers drew attention much earlier, and we find references to this subject in 1715; (9); then, in 1834; (10); then later in 1862; (11). During the short-lived reign of the Commune in 1871, a decree was issued prohibiting all night work for bakers. Since that time numerous investigations have been made, and from time to time acts have been passed regulating the industry.

There is no country where the subject of night work in bakeries received such early attention as in *Norway*, where an act prohibiting all night work in bakeries was passed as early as 1885, and has remained in force ever since.

A similar law prohibiting night work in bakeries was passed in *Italy* in 1906, after numerous investigations and parliamentary battles.

In the *United States*, the first agitation against unsanitary conditions was due to the efforts of the Bakers' Labor Unions.

In *New York State*, the agitation dates back to 1894. A law limiting the hours of labor to sixty a week was passed by the Legislature in 1895, but was afterwards declared unconstitutional. In 1896 there appeared a pamphlet published by the Bakers' International Union, entitled "Bake House Sanitation. An Inquiry into Conditions Surrounding Bakeries and Journeymen-Bakers, and Their Relation to Public Health." (12).

This report gives the results of certain investigations, and quotes also the results of investigations made by the Factory Commissioner of 1,058 bakeries throughout the State, of which 623 were found unhealthful.

In the Legislative session of 1896, Assemblyman A. J. Audett introduced a bill (No. 203) in which there was the following provision: "No cellar or basement not now occupied for a bakery shall be hereafter used for such purposes." The bill failed to pass. Since that time clauses relating to bakeries have been embodied in the laws of 1906, 1907 and 1911.

In *Pennsylvania*, an investigation of bakeries was made by the "Philadelphia Inquirer" in 1895; and in the same year in Pittsburgh by the "Leader." (13).

In *New Jersey* an investigation of bakeries and a medical examination of 933 bakers was made in 1892.

Numerous investigations have been lately carried on in more than a dozen other states, where various acts have been passed in reference to bakeries.

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### III.

#### THE INDUSTRY.

According to the United States Census in 1900, there were in the United States 14,917 bakeries, employing 60,271 wage earners. According to the Census of 1910, there were in New York State in 1909, 3,962 bakeries, employing 13,676 workers. The distribution of bakeries in the cities of the first and second class was as follows: New York, 2,489; Buffalo, 190; Rochester 106; Syracuse, 73; Albany, 64; Troy, 41; Yonkers, 35, and Utica, 28.

The art of bread making is as old as mankind, and dates back to the beginning of civilization. The mixing of ground grains with water, and the roasting of this mixture in fire is the first process of bread making, known to the most primitive tribes. Bread making is the first art mentioned in the Bible. From the Egyptians it is said that the art descended to the Greeks; although according to an old myth this art was presented to the Greeks by the god Pan.

From the earliest time to the present, bread making was essentially a home industry, an industry carried on by every woman in every household. Indeed, according to Plinius, there were no bakeries in Rome before the year 174 B. C., and only later were these introduced and flourished, as may be seen from the ruins of Pompeii. (14.) But, except in very large cities, bread making as a separate trade has always had to compete with bread making in the home.

The domestic form of the industry is favored by the few ingredients, the uncomplicated process, and the simple art of bread making.

The few essential processes of bread making are: (1st) mixing of the flour, (2nd) kneading of the dough, (3rd) cutting and shaping into appropriate loaves, and (4th) baking in the oven. These four simple processes are practically all that are used in the home, as well as in large establishments; the difference being only in the amount of the materials used and in the size of the output.

Because of the simplicity of the processes and the essentially domestic character of bread making the industry is an unprogressive one. There is hardly another trade in which the methods are so archaic, and the conditions so primitive. The same comments on bakeries and bakers may be made now that were made over two hundred years ago by Rammazzini (15).

Not only is this industry a non-progressive and domestic one, but it is in the hands of small employers; it is a petty production trade par excellence. It is carried on with very small capital, in very small establishments, and with very few workers in each.

In France there is one bakery to every 874 persons; in Belgium one to every 465 persons; in Italy one to every 930, and in the United States, one to every 4,657. (16).

In Berlin there are on an average 2.81 bakers to each bakery; in Italy 1.3 bakers, and in New York State about 3 bakers to every bakery. There were 3,002 workers in 480 bakeries, which were examined, and deducting 562 workers of the six bakery factories, there remain 2,440 workers in 475 bakeries, or about 5 to each shop. There has been, however, during the last ten years a noticeable tendency to centralize this industry, to put it in the hands of large capitalists, and to introduce a large number of machines. It is a very difficult matter to monopolize this trade, in view of the fact that the processes are so simple that it can be carried on in every household. Unless there is a complete monopoly of the grain production and flour milling, there cannot be an extensive monopoly of bread making; certainly not with an undue raising of the price of bread. For wherever that is the case, the competition of the housewife will keep all prices down to a certain level.

## IV.

## THE WORKPLACE.

We have seen that bread making is a domestic industry with which the bakeries compete with difficulty. We should note that the bulk of the trade is in the hands of petty tradesmen; that the capital invested by each is comparatively small; that there are but a small number of workers in each bakery; that each bakery caters to the trade of the immediate neighborhood; that the processes of the industry are very simple; that the number of small establishments is very great and the competition among them very keen. It follows, therefore, that the profit on every loaf baked is very small, and the smaller baker must economize as much as possible if he wishes to make a living from his trade.

The cheap rent of cellars, their availability, ubiquity, the ease with which a brick oven can be fitted into every cellar, etc., are the principal reasons for the location of the industry in cellars.

In *Paris* nearly all the bakeries are in cellars; in *Berlin* 34.4 per cent were in cellars. In *London* bakeries were mostly in cellars until 1895, when new bakeries were prohibited from occupying cellars, and all bakeries put under stringent sanitary regulation. (16).

It is not different in the United States. In *Chicago*, according to Ball (17), there were in 1907, 582 cellar bakeries, or 43 per cent of all the bakeries. In *Philadelphia*, four-fifths of the bakeries were in cellars; in *Pittsburg* 101 out of 125 were found in cellars. (13.)

The latest figures show that there are nearly 2,500 (2,489) bakeries in New York City, and according to the report of Mr. Fosdick "excluding the so-called factory bakeries, of which there are less than 100 in New York, the great majority of bakeries, if not all, are located in cellars and basements." (1). Even some of the factory bakeries do their baking in cellars. Of the 485 bakery establishments visited by our inspectors, 479 were located in cellars.

TABLE I  
TYPE OF BUILDING

	Tenement (cellar)	Loft	Dwelling (cellar)	Special Factory	Total
Number.....	431	4	39	11	485
Per cent.....	87	1	9	3	100

As is seen from the table, most of the bakeries inspected were located in cellars of tenement and dwelling houses. That these cellars are unfit for such purposes is of course not considered, as long as rent is low. Any cellar in a tenement can be converted into a bakery with the simple addition of a brick oven, which is sometimes built in the vault, very often near or at the privy vaults, school sinks or house drain.

The depth of the cellar below the sidewalk or adjoining ground depends of course upon the situation of the house. Most of the cellars occupied for bakeries are quite low underground, the ceilings of such cellars rarely being more than a foot or two above the sidewalk, and in the majority of cases at or below the adjacent ground.

The height of the cellar ceiling from its floor depends also upon the original construction of the house, the average height being about  $7\frac{1}{2}$  feet, although a large number may be much lower. In the investigation carried on by the Commissioner of Labor in 1895, there were 1,049 cellar bakeries inspected, of which 713 were 8 feet high; 258, 7 feet high; 172,  $7\frac{1}{2}$  feet; 181,  $6\frac{1}{2}$  feet; 69, 6 feet; and a number still lower; and there were three cellars five and a half feet high. (18). Our inspectors did not take exact measurements, although they give the approximate height, and their report shows that most of the cellars are about 7 to 8 feet high, showing considerable improvement since 1895.

A cellar is defined in the Tenement House Law as a story more than one-half of which is below the curb, while a basement is a story partly but not more than half below the level of the curb.





BAKERY ON HENRY STREET, NEW YORK CITY. Coal and ashes piled on floor of bakery.



Comparatively few basements are used for bakery purposes. This is partly because the rent of the basement is comparatively high, and partly because of the difficulty of building an oven in a basement floor. Wherever basements are used by bakeries, there is invariably a cellar below, which is used for the sale of the product and for living purposes by the master baker and his family.

What are the results of this location of bakeries in cellars? They are many and serious.

The following is an enumeration of the evils due to location in cellars:

<b>Peril from Fire.</b>	Dressing-rooms.
Defective Drainage.	Toilet Accommodations.
Inadequate Light.	Cleanliness of Utensils.
Defective Ventilation.	Handling of Product.
High Temperatures.	Cleanliness of Product.
Excessive Humidity.	Sleeping on Premises.
Proximity of Plumbing.	Presence of Domestic Animals.
Condition of Surfaces.	Presence of Vermin and Insects.
Washing Facilities.	Safety of Product.

*Peril from Fire:*

It is well known that fires in tenement houses and other dwellings frequently start in the cellar. A bakery in a cellar is very often the source of such fires. Attention was directed to this danger in 1894 by Fire Chief Bonner in his reports to the Gilder Commission. (19).

A great many of the cellars have ceilings consisting either of beams, or beams covered with boards. The flimsy cellar stairs which connect most of the cellars with the ground floor hallways are also an aid in rapidly spreading a fire; added to this, there is commonly much rubbish, paper, etc., strewn all over the cellar.

There is also a large element of danger to the employees of bakeries in case a fire starts in any part of the cellar near the entrance trap door or stairway. The ordinary cellar is provided with only one door, which serves as a means of entrance and exit.

This door is usually located either in front of the house, or at its extreme rear, so that there is a distance of from 50 to 70 feet between the exit and the place where the work is carried on.

### *Defective Drainage:*

It is only within the last ten years that tenement houses have been built with compulsory damp-proof courses in the foundation and sides of the house. All houses previously constructed were built without any protection against dampness, so that many cellars are not only damp, but actually partly filled with water. Especially is this the case in the cellars of houses situated upon marshy ground, or upon filled-in ground, as in streets nearing the river front, where most of the cellars and bakeries therein are flooded during storms and high tide.

The cellar floors are usually very damp. Although lately this has been lessened by the concreting of floors, our inspectors found 132 cellars where floors were damp.

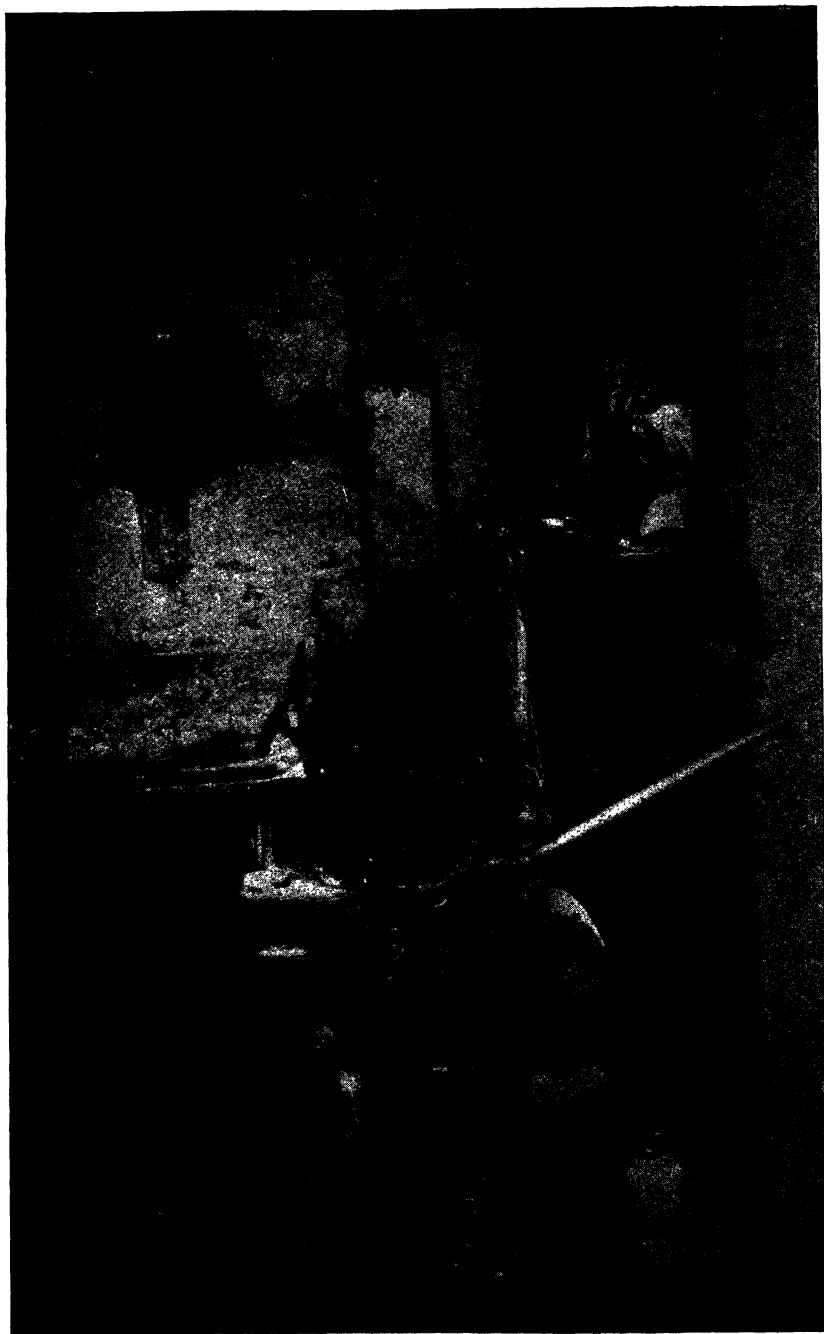
TABLE II  
FLOORS AND DRAINS OF 497 BAKE SHOPS\*

	MATERIAL			Wood and concrete	Concrete	No report	Dry	CONDITION	
	Earth	Wood	Stone					Damp	No report
Number.....	1	168	2	172	146	8	340	132	25
Per cent.....		34	....	34	30	2	68	27	5

### DRAINS

	LOCATION			CONDITION		
	Above	Below floor	No report	Good	Bad	No report
Number.....	167	279	51	235	108	154
Per cent.....	33	57	10	47	22	31

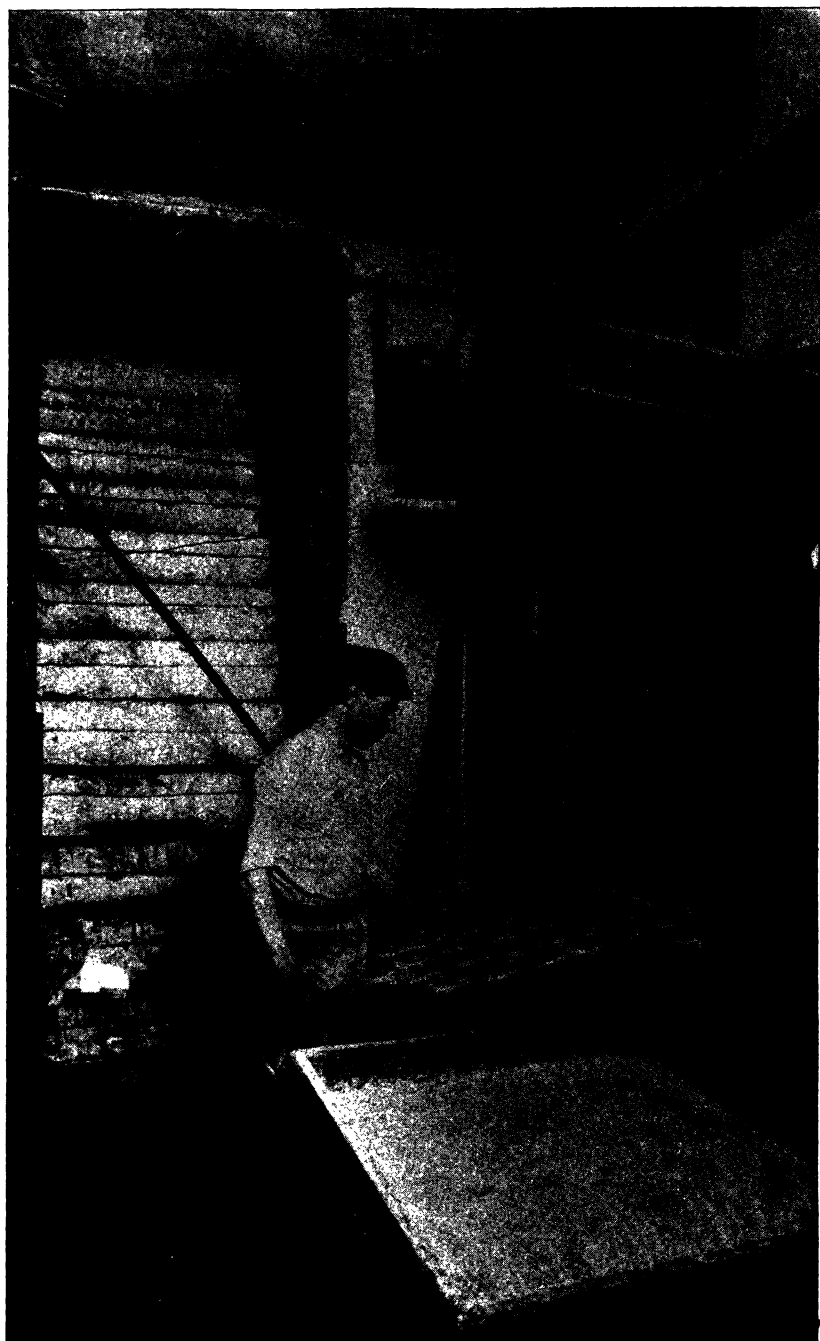
\*NOTE.—In this and following tables the unit is the floor or shop.



BAKERY ON HENRY STREET, NEW YORK CITY. In a dirty corner of this bakery, to the right of the moulding board, is an open window leading to a dirty court.

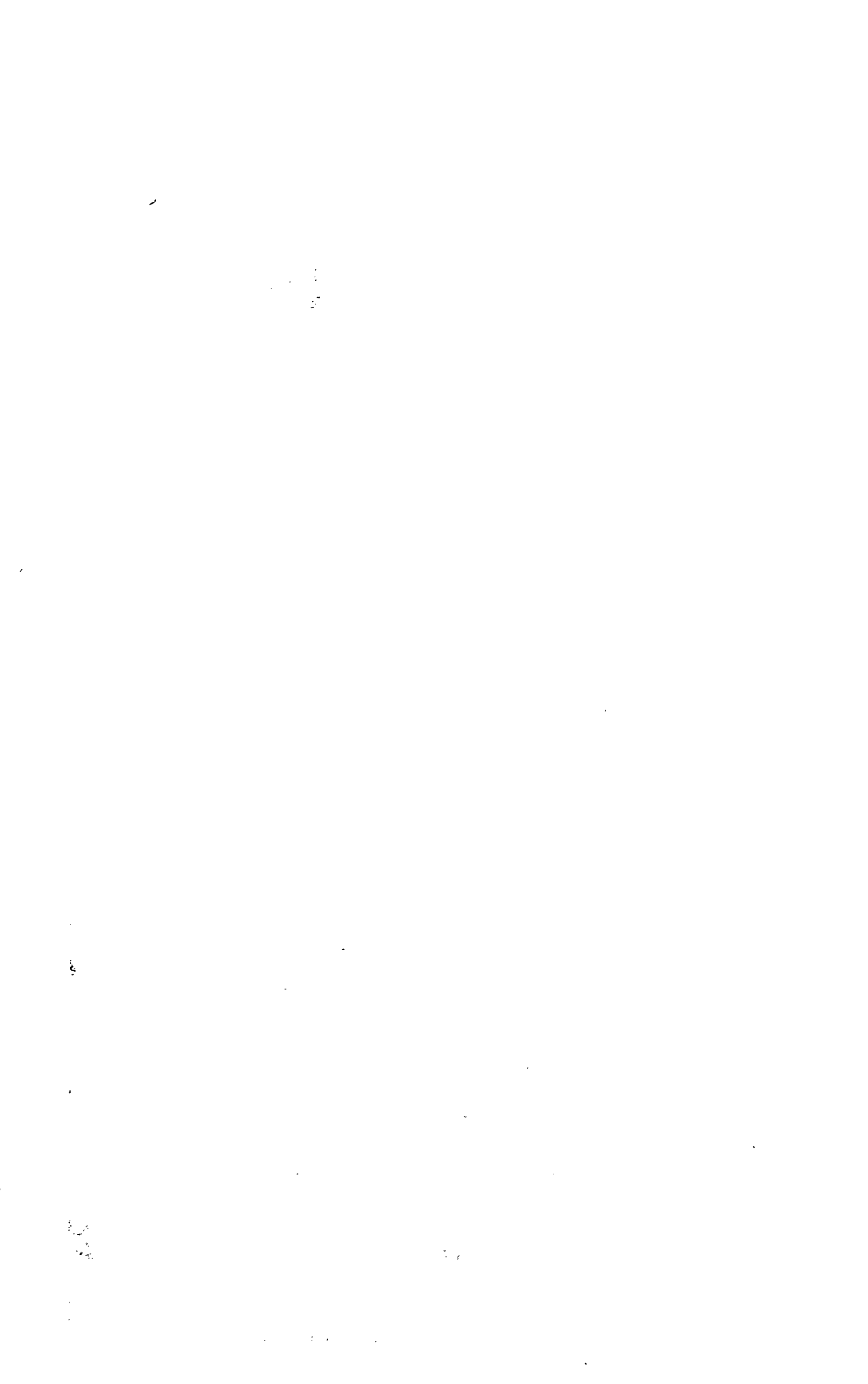






BAKERY ON MARKET STREET, NEW YORK CITY. The door at his elbow is open. At the top of the steps is a grating in the street sidewalk. Men were standing on this grating, dust and refuse is constantly dropping down on the cakes and bread.







*Inadequate Light:*

It is obvious that a cellar cannot have sufficient natural light. Most of the cellars get their light from small horizontal grated openings, and very few have any vertical windows to the outer light and air. Wherever such windows are found they are very small, and their usual condition is unfavorable to the admission of sufficient light.

The result is that all cellar bakeries use artificial light at all times. Insufficient light also affects the dryness of the cellar, the walls, ceilings and floors, the air within, and the cleanliness and salubrity of the place, for natural light is the best disinfectant we have, especially for mould and other low forms of germ life. Artificial light raises the temperature of the cellar rooms and adds to the impurity of the air by the processes of combustion.

*Defective Ventilation:*

It is hardly necessary to point out that the air in cellar rooms cannot be pure or abundant.

Apart from the fact that cellars get all the underground air, which contains a large proportion of carbon dioxide, the air is affected by the dampness, by the lack of natural light, by the extremes of temperatures and humidity, by the dust and dirt blown in through doors and openings, by the lack of windows or openings to the outer air, and by a great many other causes. Indeed, the air of bakeries is stifling and foul, and the workers constantly complain of this condition.

TABLE III  
LIGHT AND VENTILATION OF 497 BAKE SHOPS

	WINDOWS IN BAKERIES				Fans	Special venti- lating devices	Arti- ficial light	Total
	No windows	One window	Two windows	More than two windows				
Number.....	171	102	68	156	12	6	439	497
Per cent.....	35	20	14	31	2	1	88	100

*Temperature and Humidity:*

There are few cellar bakeries where the oven is separated from the rest of the bakeshop. The temperature near the oven is naturally very high, and there is also a need for high temperatures throughout the bakeshops in order that the dough may "rise." Add to this the low ceiling, the lack of ventilation, the artificial illumination, and some idea is gained of the temperature found in cellar bakeries. Our inspectors found temperatures in bakeries ranging from 75 to 90 degrees.

The humidity is also high, caused partly by the baking processes, partly by the moisture produced by illumination and by the profuse perspiration of the workers themselves. The wet bulb thermometer showed in some places 85 degrees Fahrenheit and above. This is a very serious evil and of great importance to the health of the workers.

*Proximity of Plumbing Pipes and Fixtures:*

This is another evil which characterizes cellar bakeries. The house drain is located in cellars, sometimes below, and at times above ground. Not so long ago house drains were made of brick, clay, and earthenware, and there are still a number of houses where these earthenware housedrains have not been replaced by iron ones. Earthenware or brick drains are filth channels, because of the ease with which they break and make cellars extremely foul and full of sewage. Iron pipes are often defective, have numerous open hand-holes, are not properly covered, and drip with moisture. Such drains are often used as a place for unfinished or finished bread products. Sinks are enclosed by woodwork, are usually foul, saturated, and emit bad odors. The space within the enclosures is often filled with rubbish and dirt, and is a breeding place of vermin.

*Conditions of Cellar Surfaces:*

The worst floors are those made of wood or earth. Floors of wood on concrete are also very objectionable because the wood is damp, saturated and foul. Only in 146 bakeries were the floors found to be of non-absorbent materials. The walls and ceilings are of plaster as a rule, although there are a number of cellars

where the lath is exposed and the plaster of walls broken off. The cleanliness of walls and ceilings and floors leaves much to be desired, as will be seen from the following table.

TABLE IV  
497 BAKE SHOPS CLASSIFIED ACCORDING TO GRADES OF CLEANLINESS  
CLEANLINESS OF WALLS

	Grade "A"	Grade "B"	Grade "C"	Grade "D"
Number.....	32	264	135	66
Per cent.....	7	53	27	13

## CLEANLINESS OF CEILINGS \*

	Grade "A"	Grade "B"	Grade "C"	Grade "D"
Number.....	40	214	126	110
Per cent.....	8	43	25	22

## CLEANLINESS OF FLOORS †

	Grade "A"	Grade "B"	Grade "C"	Grade "D"
Number.....		248		235
Per cent.....		49		47

## CLEANLINESS OF UTENSILS ‡

	Grade "A"	Grade "B"	Grade "C"	Grade "D"
Number.....	28	244	144	73
Per cent.....	6	49	29	15

\* 7 shops not reporting.

† 14 shops not reporting.

‡ 8 shops not reporting.

### *Washing Facilities:*

The washing facilities commonly found in bakeries are the sinks. These sinks are often dirty and have no provision for hot water. Even those facilities were lacking in 65% of all the bakeries inspected. With the amount of dirt clinging to the hands of workers, with the profuse perspiration, dust, etc., in such shops, it would seem that ample washing facilities are absolutely indispensable for the cleanliness of both.

### *Dressing-Rooms:*

In none of the cellar bakeries was there any special place provided for hanging and keeping the street clothes of the workers; these clothes being placed upon the tables and walls and in very

close proximity to the bread and pastry products. Many bakers work in their ordinary clothes or underwear, and partly nude.

*Toilet Accommodations:*

In 109 or 22 per cent of the bakeries inspected, toilets have been found in the bakery cellars, 101 of these being totally dark; 86 very filthy; 114 very badly ventilated. The location of toilets in cellars is obviously very objectionable, but it still exists in spite of legal prohibition. The proximity of these fixtures, especially when they are in such an unsanitary condition, is very objectionable.

TABLE V  
LOCATION AND CONDITION OF WATER-CLOSETS IN 497 BAKERIES

	LOCATION*			CLEANLINESS †			
	On premises	Separate	No water-closet	Grade "A"	Grade "B"	Grade "C"	Grade "D"
Number.....	109	323	29	19	107	114	86
Per cent.....	22	65	6	4	21	23	17

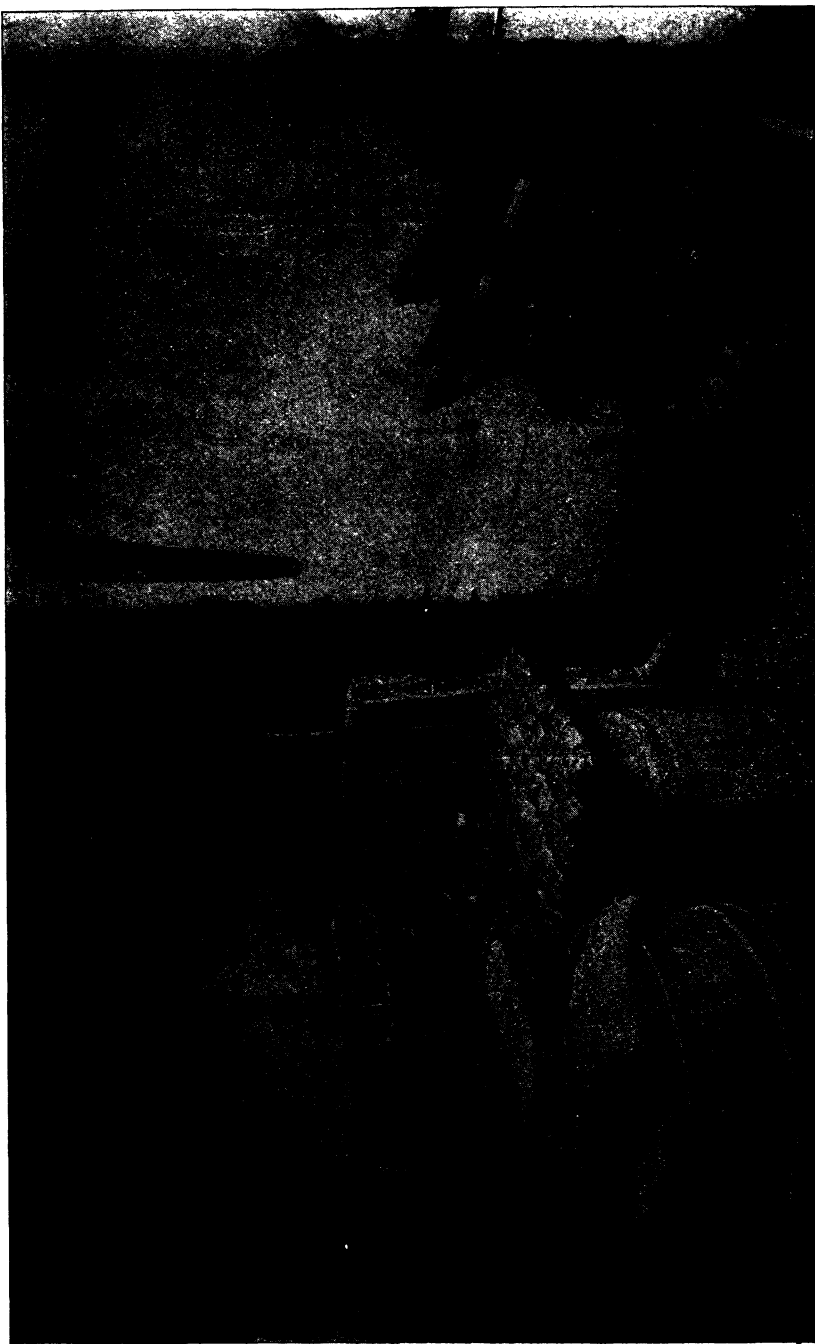
\* 36 shops not reporting. † 171 shops not reporting.

	LIGHT ‡				VENTILATION §			
	Grade "A"	Grade "B"	Grade "C"	Grade "D"	Grade "A"	Grade "B"	Grade "C"	Grade "D"
Number.....	26	115	80	101	43	89	82	114
Per cent.....	6	23	16	20	9	18	16	23

‡ 175 shops not reporting. § 169 shops not reporting.

*Utensils:*

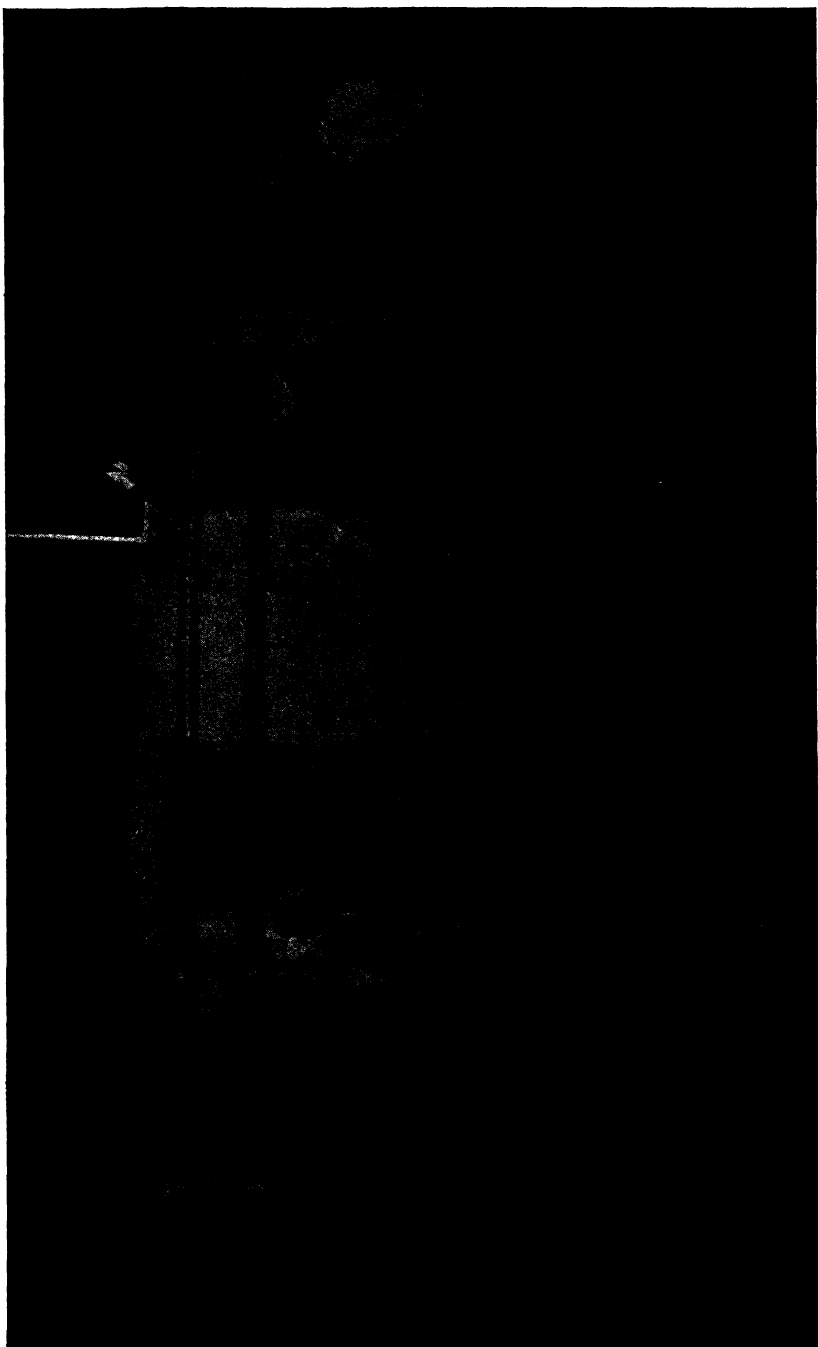
The utensils found in bakeries, such as vats, pans, mixing boards, dough boards, moulding boards, etc., are kept in a very bad condition. They invariably look as if they were never cleaned, and it seems unlikely that they are thoroughly cleaned, because of the lack of hot water in such places, as it is hardly possible to clean them properly without the use of hot water.



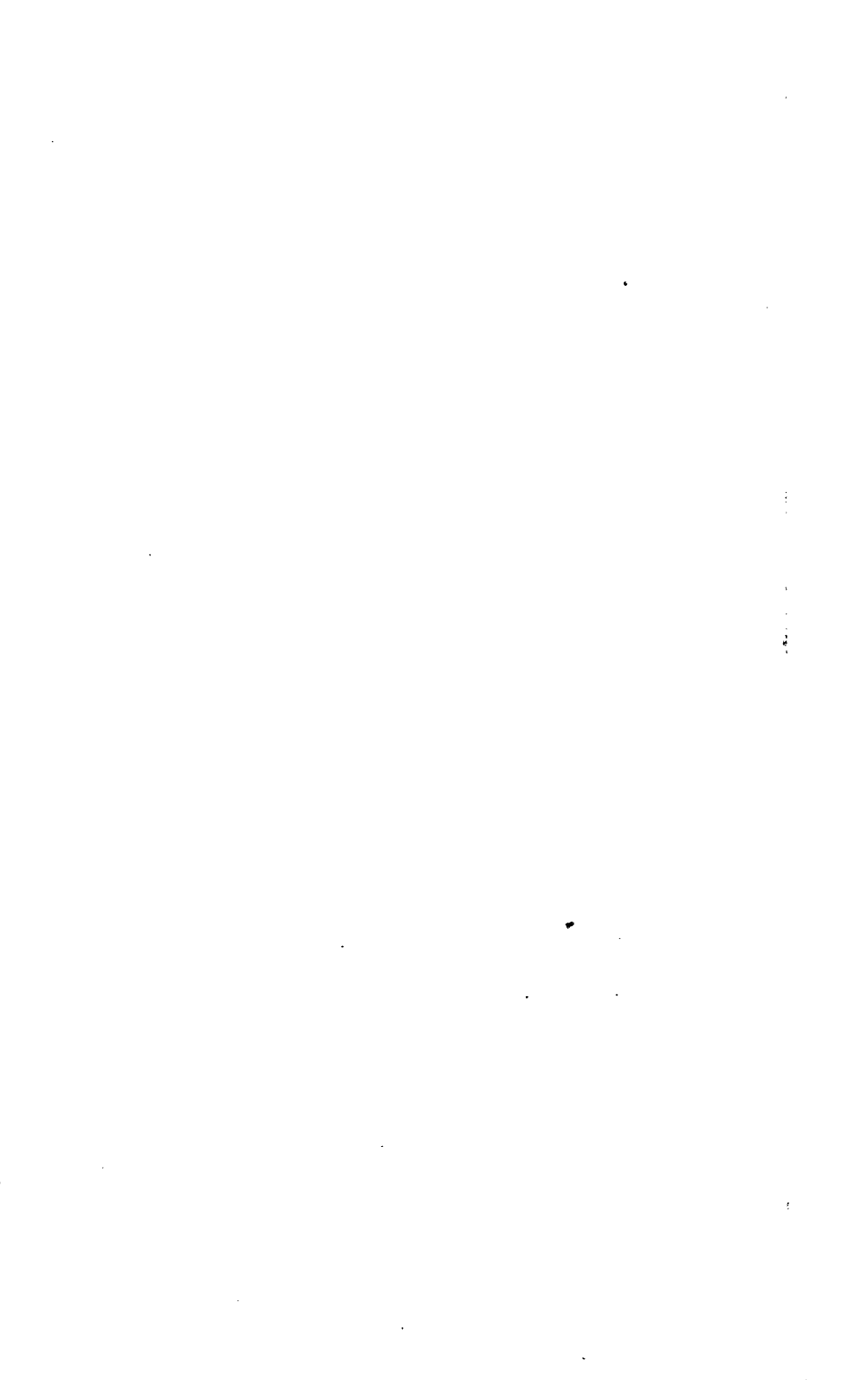
BAKERY ON HENRY STREET, NEW YORK CITY. In the corner, foreground of photo, is a coal bin. Coal is shoveled and kindlings broken up, etc. with cakes and rolls resting near by and getting the dust.







CELLAR BAKERY ON MOTT STREET, NEW YORK CITY. Bakery in cellar. Man sitting on moulding board with a dirty kitten in his lap. The man with the bottle is drinking whiskey. In the corner is seen an open drain pipe from the tenement above.





*The Handling of the Product:*

There is hardly any industry where so little precaution is taken in the handling of the product.

It is recorded that in ancient times the slaves who were baking bread for their Roman masters were compelled to wear cloths tied around their faces and necks, in order that their perspiration should not fall into the baked product. There seems to be less objection against eating our bread literally mixed with the sweat of the brow now. The profusely perspiring bakers have not the time or inclination to wipe off the beads of sweat, which as a result fall into the dough. It is not rare to see bakery workers place the dough on their nude bodies, or make it serve for a pillow to rest their heads upon.

In only one bakery — and that a model one — have the workers been provided with gloves for handling the product.

*The Cleanliness of the Product:*

It is fortunate that much that occurs in bakeries is not observed by the consumers, otherwise the consumption of bread bought from bakeshops would surely be greatly reduced, and home baking be more the rule than it is now. Even were all possible precautions taken during the making of the bread, there is absolutely no possibility of preventing the contamination of the product by the abundant dirt and dust in the bakeries or by handling during and after its production.

*The Presence of Animals, Vermin, Flies, etc.:*

The cleanliness of the product is not improved by the presence of domestic animals and flies, insects and vermin, etc.

Cats are almost a necessity in cellars where the bread and flour products attract many mice. Where there are cats there are often litters of kittens; these sometimes are found upon the utensils, or retiring upon the dough. Their presence is a matter of course and does not excite any comment. Some of these animals may suffer from infectious diseases.

Flies are numerous, as there are very few cellars effectively screened, and it is almost impossible to keep the ubiquitous fly out in warm weather. These flies, born in manure and filth, carry on a traffic in the nearby dung heaps, toilets, street sweep-

ings, and then rest upon the unprepared and prepared bread products. Still more frequent, indeed always present, are the numerous bugs, insects and vermin. Photo No. 11 shows the wall of a bakery full of ants.

The practice of sleeping in cellars is very prevalent among workers. Our inspectors have found ten persons actually sleeping in the bakeries, but our inspections were made during the night when work was going on. Abundant evidence was found of sleeping during the earlier hours of the day — and when the workers have to wait for the processes to be started. Among baker apprentices whose wages are very small, the standard of living is so low that they do not object to using the cellars as sleeping places.

TABLE VI

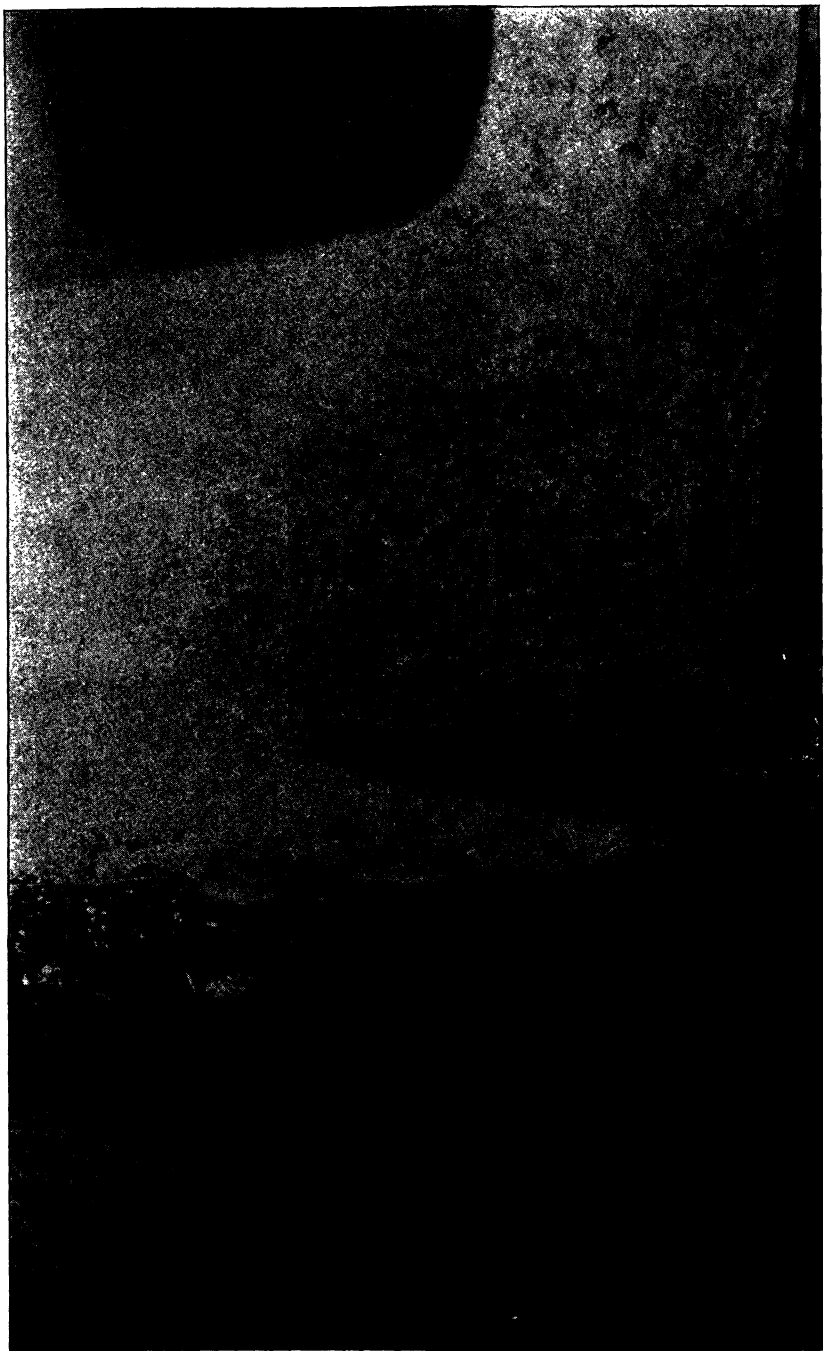
	Number	Per cent.
Ample washing facilities .....	314	65
Cuspidors provided .....	31	6
Spitting prohibited .....	94	19
Evidence of sleeping in bakery .....	10	2
Presence of domestic animals .....	275	55
Flies .....	236	57
Cockroaches, etc .....	204	40
Other insects (not specified) .....	88	18

### *Safety of the Product:*

The question naturally arises what effect the conditions under which bread is made have upon the cleanliness of the bread and other bakery material, and whether the consumption of bakers' stuff is safe under these circumstances.

It has been definitely determined that the baking process, which should sterilize the product, does not necessarily destroy all infectious agents in the bread.

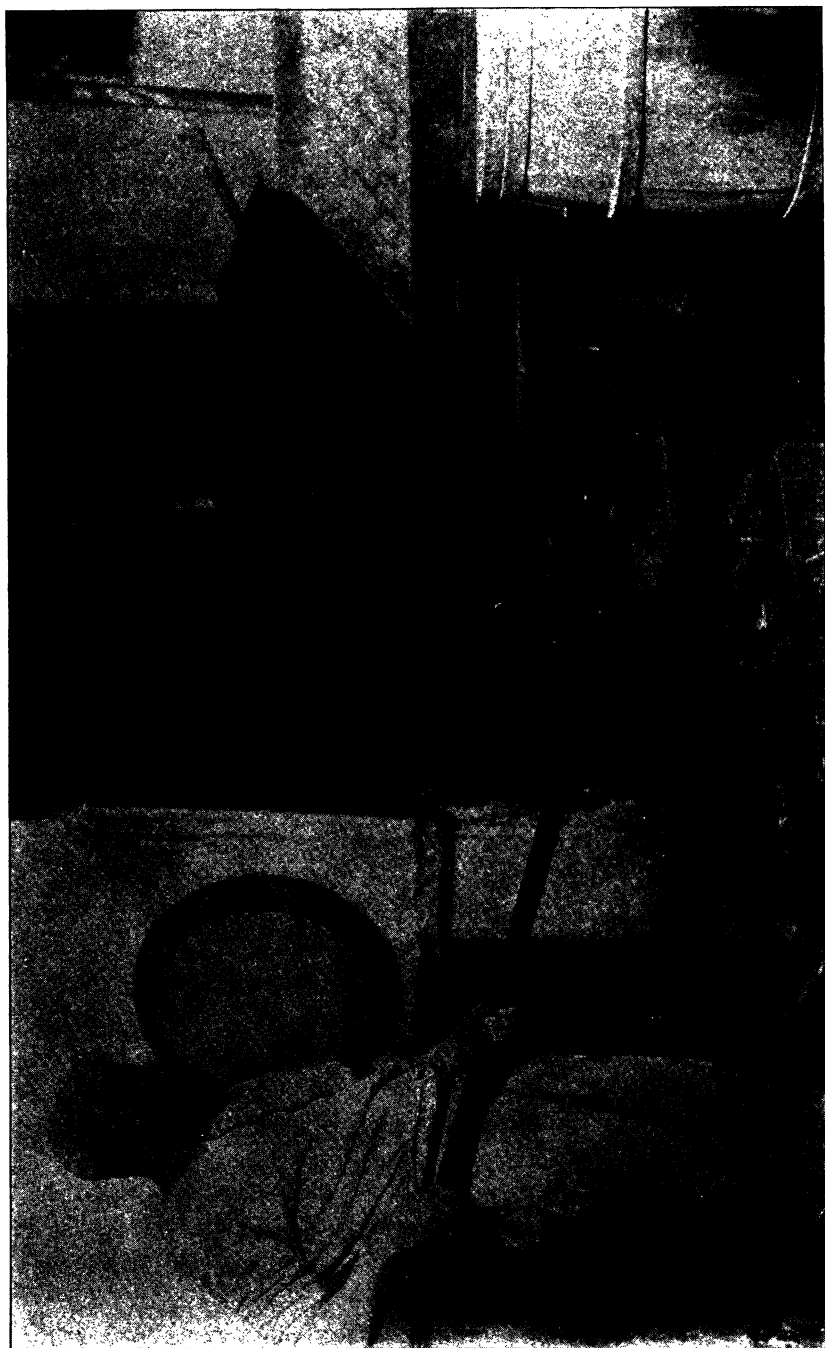
In the investigation made for the Lancet Commission (4) and afterwards published by Waldo and Walsh in their book, numerous experiments are mentioned which show that the temperature which reaches the center of the baked loaves does not exceed 180 degrees Fahr., and that pathogenic bacteria may not be destroyed, certainly not the spore-bearing bacteria. "We see no reason," say Drs. Waldo and Walsh, "why the origin of many mysterious septic invasions of the human body may not eventually be traced to



BAKERY ON HENRY STREET, NEW YORK CITY. The wall was alive with ants.







BAKERY ON MARKET STREET, NEW YORK CITY. Baker shoveling coal with pan of rolls near by. A bin of dust and ashes near by. Photo-  
graphed by Lewis W. Hine, about 11 p. m., November 8, 1911.





the agency of infected bread," and "baking does not necessarily destroy the vitality of the micro-organisms contained in the dough."

(5) Experiments have demonstrated that tubercle germs may survive the baking process, and that cholera germs put into the flour may have the vitality to infect persons eating the baked product.

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## PART SECOND

### THE HEALTH AND DISEASES OF THE BAKERS

#### A MEDICAL EXAMINATION OF EIGHT HUNDRED BAKERY WORKERS.

##### I.

It would be strange indeed if the unsanitary conditions of bake-houses described above should not affect the workers.

Indeed, bakers are proverbially unhealthy and the trade of baking one which cannot be long carried on with complete impunity.

Over two hundred years ago, Rammazzini, in speaking of bakers (15), said, "that the bakers in the course of their work are brought under the lash of various diseases," and in 1832 Thackrah (20), stated that "bakers are generally pale and unhealthy." The testimony of almost all those who have been investigating the subject of the health of the bakers since Rammazzini is unanimous that the bakers suffer from many diseases on account of the abnormal conditions existing in their trade.

The *character* of the persons entering the trade has of course much to do with their suffering from the effects of the trade conditions. Until very lately, and even in the present day, the ranks of the bakery workers have been recruited from a class of people rather poor in physique, low in intelligence, and inclined to alcoholic and other excesses. Undoubtedly this is due to the unsatisfactory conditions which are known to exist in the trade, and which deter a better class of artisans from entering it.

*Sex:*

There are very few women in the trade. This is strange at first sight, in that bread-making is distinctly woman's work, and that practically every housewife is able and does follow the occupation of break-making and baking.

Yet there have never been many women employed in this industry, although women have crowded into other and more strenuous trades. In our investigation we found women, but they were employed in one or two large bakeries and were engaged in wrapping up the bread.

The explanation probably lies in the fact that the notorious conditions of the cellar bakeries have always deterred women from entering into competition with men in the baking trade.

*Age:*

As to the age of bakers, it is known that there are few either very young or very old persons in the trade.

There were in olden times a large number of apprentices, young boys, in the baking trade. Much attention was paid to the health of these boys, and many laws were passed limiting the age at which they might enter the trade. There are at present not many workers under 16 or 18 years of age.

In our investigation we found only three below 16 years in the 500 shops.

The number of persons over 45 years is not very large in the baking trade. This is partly explained by the fact that many of those who have been fifteen or twenty years in the trade become master bakers, a comparatively easy advance, as little capital is needed to start a small cellar bakery. The other reason for the scarcity of men over 45 years of age is that the mortality of the trade is very high. Twenty or thirty years after their entrance into the trade, many get into such a debilitated condition physically that they are unfit for the trade and drift into some easier occupation.



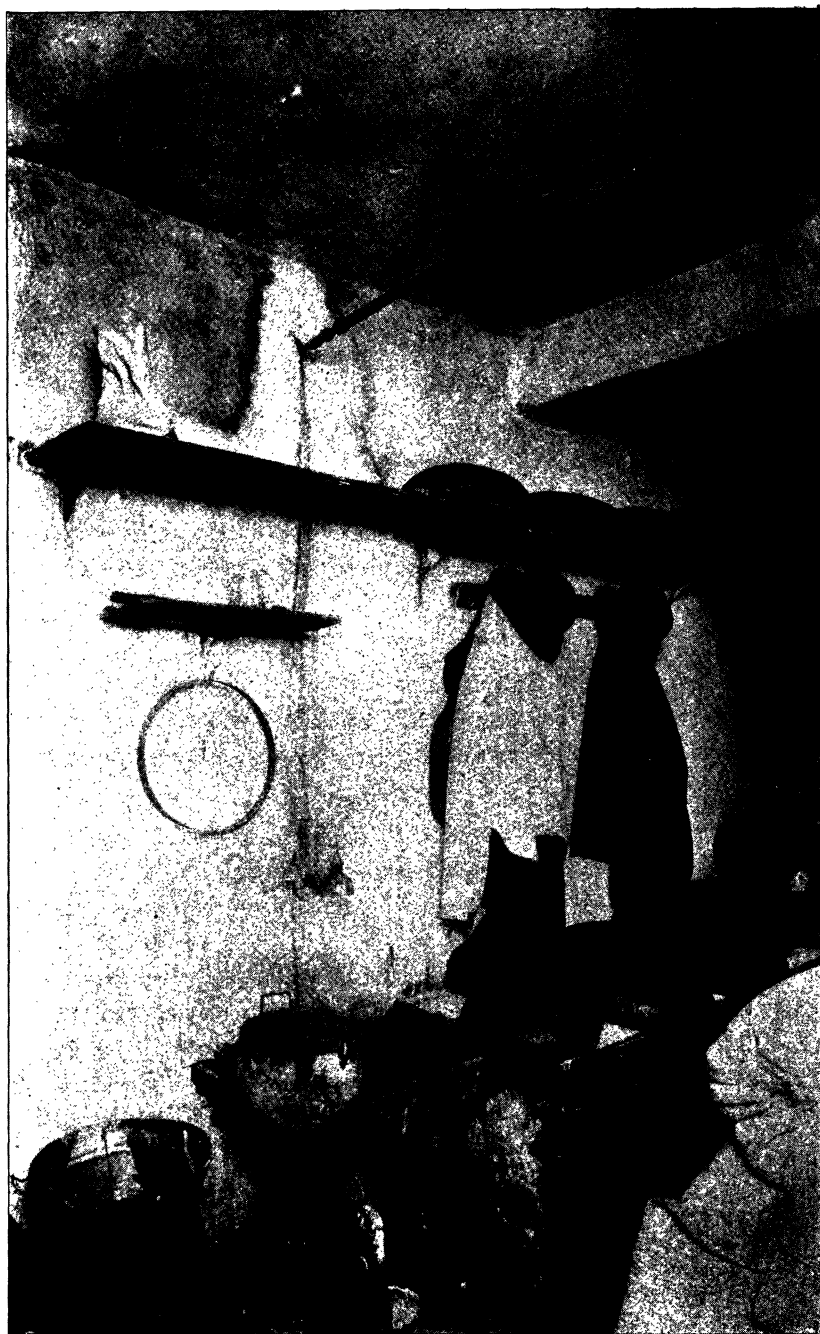




BAKERY ON MONROE STREET, NEW YORK CITY. Cat feeding on bench upon which bread dough is rolled out. In this bakery the inspector found a cat sleeping on the bread.







BAKERY ON HENRY STREET, NEW YORK CITY. The dirty pants and coats of the bakers were hanging on top of, and resting upon, the new baked bread.



## II.

## CONDITIONS AFFECTING THE HEALTH OF THE WORKERS.

What are the conditions unfavorably affecting the health of the bakery workers?

Among the conditions which have been mentioned but not sufficiently emphasized is the high temperature to which the bakers are subjected, while other conditions, not yet discussed, are low wages, long hours of work, and night work.

*Temperature:*

That bakers are compelled to work in places where the temperature is very high has already been noted. The high temperatures, in connection with the lack of clothes worn while at work, and the strenuous efforts required in kneading the dough, and the draughts in the cellar bakeries due to the doors and gratings, are bound to affect unfavorably the health of the workers and to cause various pulmonary disorders.

*Corlieu* (21) ascribed to these causes the frequent respiratory diseases from which the bakers suffer, as well as the rheumatic troubles due to the high temperatures under which they work.

*Zadek* (22) states that high temperatures and profuse perspiration cause the great thirst of bakers, which they seek to quench with cold drinks and alcoholic beverages, and they therefore suffer greatly from digestive disturbances, nervous diseases and from cardiac affections.

According to *Emmerich* (23) the relatively high humidity of the air in bakeries, combined with the high temperatures, "lead to vasomotor disturbances, and undoubtedly influence the composition of the blood, as they cause a rise in the body temperature." With a high temperature in the bakeshop, and with an atmosphere humid almost to saturation, the natural evaporation and cooling of the body by perspiration is difficult."

*Low Wages:*

It is a characteristic trait of many industries conducted under unsanitary conditions that they are filled with a class of workers who are paid very low wages.

The fierce competition of the bake shops with domestic bread-making, and with each other, the low standard of the workers, and the lack of organization, all contribute to the low wages of the bakers.

In the investigation of the Commissioner of Labor in 1894 already referred to above, it was shown that the large majority of workers in the bakeries in New York State have been getting less than \$12.00 a week. Of the 1,940 bakers among whom inquiry was made, only 242 have received \$12.00, and less than 300 above that figure, while 188 were getting \$10.00; 195, \$8.00; 150, \$7.00; 127, \$6.00; 143, \$5.00; 94, \$4.00; 66, \$3.00; and 24, \$2.00 per week.

The present wages paid to bakers are somewhat higher on the average, owing to the successful struggle of the Bakers' Unions, but they are still quite low and do not average more than \$14.00 per week, according to the statement of leaders of the union. The wages are lower among the unorganized workers.

### *Long Hours of Labor:*

The length of the working day is determined by many circumstances, but it has also a natural limit. The worker needs a certain number of hours out of a total of twenty-four to recuperate his bodily strength, a certain number of hours to satisfy his physical wants, and certain time to satisfy intellectual needs and enjoy some recreation and social intercourse.

Unfortunately the bakery industry is characterized not only by the extremely unfavorable conditions already discussed in detail, but also by unduly prolonged hours of work.

In the investigation already referred to, made by the Commissioner of Labor of New York in 1893, the long hours of labor of bakers were described in detail.

Some of the bakers examined had worked the following hours: 85, 60 hours per week; 89, 62 hours; 48, 66 hours; 83, 67 hours; 92, 68 hours; 91, 69 hours; 165, 72 hours; 203, 74 hours; 62, 80 hours; 76, 88 hours; 16, 90 hours; 19, 100 hours; 11, 105 hours; 112, 110 hours; 2, 111 hours; 3, 112 hours; 3, 126 hours. (18.)

At present the hours of work in New York bakeries are limited where union conditions prevail to 10 hours per day, and 60 hours per week, but wherever they are not organized they still work very long hours, not less than 12 daily, at times much longer.

Indeed, it is no new thing for the bakery workers to complain of long hours of work. The Commissions which investigated the condition of bakers in Ireland and England in 1861 and 1862 reported as follows: "The Committee believes that the hours of labor are limited by natural laws which cannot be violated with impunity. The Committees believe that they cannot work beyond 12 hours a day without encroaching on the domestic and private life of the working man, and so leading to disastrous moral results, interfering with each man's home and the discharge of his family duties as a son, a brother, a husband, or a father—that work beyond 12 hours has a tendency to undermine the health of the working man, and so leads to premature old age and death." And yet, nearly half a century later, judges of the Supreme Court have in their superior wisdom decided that to limit the hours of labor of adult bakers to 60 hours per week would deprive them of "their freedom of contract," and declared the law unconstitutional.

It seems obvious that even in trades where conditions are exceptionally good and hygienic, extremely long hours of labor would act injuriously upon the health of the workers, and hence lower the vitality of the nation and the race. This is doubly true in an industry where, as we have seen, all other conditions of work are so unfavorable.

*Chief Justice Parker* declared, in the case of "*People vs. Lochner*," "it is to the interests of the State to have strong, robust, healthy citizens, capable of self-support, of bearing arms, and of adding to the resources of the nation. Laws to effect this purpose by protecting the citizen from overwork and requiring a general day of rest to restore his strength and preserve his health, have an obvious connection with the public welfare." (24.) As is well known, the case was finally decided against the State, as interfering with "freedom of contract," as the court could not be convinced that the long hours did interfere with the health of the operatives.

*Night Work:*

To all the conditions injuriously affecting the health of the bakers and endangering their lives, one more, and a very important one, must be added, viz., night work.

Night work in the baking industry is at present prevalent all over the world, with the exception of those countries where it has been prohibited by legislative action.

Notwithstanding the prevalence of night work in the baking industry, it was not always a characteristic of this industry.

In England, night work dates, according to the report of the Commission of 1862, from 1824, when it gained a footing in London.

The story of the beginning of night work in Paris is interesting, and is told thus: "It was under Louis XIV, a big baker on Ferroneri street, moved through his jealousy of an intelligent competitor, wanted to have fresh bread in the morning before his rival, and made his workmen begin an hour earlier, that is to say, at six in the morning, instead of seven. The rival, in his turn, being just as short-sighted, put his men at work at 5 A. M.; then the first man made it 4 o'clock. The other baker followed the example. From 4 o'clock in the morning they went to three, and so forth, from baker to baker, until the day work was replaced by night work." (16.)

From Paris the custom of night work spread to other cities, and then to foreign countries. According to the Secretary of the German bakers, night work in Germany was a Paris innovation, and dates back about 120 years.

At present, in the United States and in other countries where night work is not prohibited, work in bakeries begins at any time between 8 and 12 p. m.

The effects of night work upon the health of the workers is extremely bad. The following passage from "The Dawn," a daily paper of Lugano, Italy, December 1st, 1906, states the effects of night work very admirably:

"All night work is harmful to the body, even if it is voluntary; if it is compulsory, it is still more so; when it is habitual, it also becomes harmful morally, because it upsets the customs of life, which are founded on the laws of nature, and in this way, banishes



the workmen far from the social life. If it *were* absolutely necessary, the night work of the bakers would be a *sad* necessity; forced on them merely by a custom, it is an injustice for which we are all to blame. To wish that it be kept up, not for necessity's sake, but for our pleasure, shows the harsh egoism of a race not yet refined by the civilization of which it boasts." (16.)

Dr. Epstein, in his book "Arbeiterkrankheiten," speaks of the effects of the long hours of labor and of night work as follows:

"The long working hours, which would be sufficient cause to bring on grave effects on health, fall, in the bakery business, on that part of the day which nature has destined for sleep. Doctors and hygiene experts are unanimous in declaring that sleep at night can in no wise be replaced by sleep in the daytime, and that a prolonged scorn of the need of sleep must ruin a man's health. It is also clear that this degeneration in health is not shown by the specific diseases, but by a general weakening of the body, whose resistance to the normal or pathological excitations of existence (contagious diseases) is destroyed. The most recent inquiries on the cases of over work show that we are really in the presence of chemical intoxication." (28.)

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### III.

#### THE DISEASES OF THE BAKERS.

In order to study the effects of the unsanitary conditions of the bakeries and the unhygienic circumstances under which the work is conducted, bakers have been from time to time examined and their mortality from certain diseases determined.

Hoffman refers to a medical examination of 933 bakers, undertaken in New Jersey in 1892.

The physical examination of 800 bakers, made under the auspices of the New York State Factory Commission during October, is the only medical examination of bakers ever made in this State.

The examination was made during the four weeks beginning with October 25th and ending November 10th, 1911, and was con-

ducted under my immediate direction by a staff of six physicians, the majority of whom were recent graduates from reputable medical colleges, and who had had from one to three years' hospital practice after graduation. The examination was conducted in the bakeries, simultaneously with inspections of the shops, and in a number of cases with the aid of interpreters furnished by the Baker's Union, which assisted us in all possible ways.

The majority of examinations were made during the hours between 8 p. m. and 12 m., although some were also made in the earlier hours of the day. In all cases the chest of the baker was bared and a stethoscopic examination made, each examination lasting from fifteen minutes in negative cases, to a half hour or more in cases where there was a positive indication of some pathological condition.

As already noted, all districts of the city have been covered, and examinations made in good and bad bakeries. A number of men of every nationality were examined, although Russian workers constituted the largest number of those examined. The examination card shows the method of inquiry. All the bakeries inspected were union shops and the bakers were union members, and these, it is probable, are in a better physical condition than non-union members, who usually work under less favorable conditions.

No correlated tabulation has as yet been made on account of lack of time, and there are a number of points not yet brought out in our examination, such as the relation of the nationalities to the kind of bakeries and the sanitary conditions, the relations of the ages and the times of entering trade, the relation of age of workers to the diseases, etc., and many other points which will be taken up later in a supplementary report on all of the food-producing trades.

The physicians in the first few days of the examinations took, as a matter of routine, the sputum of every man examined, but the 120 specimens taken were all negative, and as it was extremely difficult to get any real sputum by this method, this test was omitted in the later examinations. The examination was made in the shop, in the presence of all other employees, the workers submitting with will and interest. No secondary examination was made even of cases where a positive indication of tuberculosis was found.

Table VII shows the results of the examination. The tabulation has not yet been made in detail and is not complete. Where anemia was put down by the physicians as a disease, they were instructed to describe only well-defined or extreme cases, not slight paleness.

Of the 800 bakers examined, 347, or 43 per cent, were found free from any disease, while 453, or 57 per cent, had some indication of defective physical condition.

The diseases found were, as seen from the table: Tuberculosis, 19; Bronchitis, 177; Pleurisy, 2; Venereal Diseases, 3; Diseases of the Skin, 59. The percentages given refer to the whole number examined (800). Deducting the cases of anemia, rhinitis, all digestive diseases, all hernia cases and all of flat feet, there still remain 422 separate cases of diseased conditions.

The data which is important in an effort to determine the effects of an industry upon the workers, is in regard to the average life, the general mortality rate, the mortality rate from special causes, the general morbidity rate, and the morbidity rate from special diseases.

### *The Average Life:*

Bakers are, according to all authorities, a short-lived race.

*Arlidge* says (25), "those who have read the reports on hygienic state of bake-houses, and the circumstances of labor in them, will not be surprised that the mortality of bakers ranges high."

The average life of bakers, according to older statisticians, is 50.3, according to Neufvill (51); according to Hirt (26), 45.1; according to Spatz, 36.2; according to the English Commission of 1862 (Marx), 42. According to Fox, few bakers last more than 20 years in the trade (28).

### *General Mortality, and Mortality from Special Diseases:*

According to the English, French and Swiss statistics, the average mortality of bakers does not range very high in comparison with workers in other trades. A possible explanation of this fact is the known tendency of bakers to forsake their trade in their old age, or before they become old, so that the number of

TABLE

PRELIMINARY TABULATION OF THE RESULTS OF A PHYSICAL

	NUMBER		NATIONALITY						
	Number	Per cent	Russian	German	Austrian	Italian	Bohemian	Hungarian	Polish
Total number of bakers examined.....	800	100	249	214	106	102	42	25	22
Number of bakers in normal condition, i.e. free from any disease or deformity noted below.....	347	43	82	138	23	33	28	13	8
Number of bakers with one or more diseases noted below.....	453	57	167	176	83	69	14	12	14
General diseases:									
*Tuberculosis.....	19	2.4	7	4	4	2	...	1	...
Rheumatism.....	47	5.9	10	20	5	5	1	3	...
†Anæmia.....	183	22.9	71	13	48	38	2	3	3
Veneral diseases.....	3	.4	2	...	...	1	...	...	...
Total general diseases.....	252	31.6	90	37	57	46	3	7	3
Diseases of the nervous system and organs of special sense:									
Diseases of the eye:									
Chronic conjunctivitis.....	83	10.3	34	3	30	13	...	2	...
Keratitis.....	2	...	...	...	...	...	...	...	...
Blepharitis.....	6	.8	7	...	1	1	...	...	...
Nystagmus.....	1	...	...	...	...	...	...	...	...
Other nervous diseases.....	6	.8	3	1	1	1	...	...	...
Total nervous and special sense diseases.....	98	11.9	44	4	32	15	...	2	...
Disease of the circulatory system:									
‡Cardiac diseases.....	54	6.8	17	16	11	7	1	...	1
Phlebitis.....	41	5.1	17	...	13	8	1	...	1
Total diseases of circulatory system.....	95	11.9	34	16	24	15	2	...	2
Diseases of the respiratory system:									
Bronchitis.....	177	22.1	58	49	30	21	4	5	7
Pleurisy.....	2	.3	...	1	1	...	...	...	...
Asthma and emphysema.....	21	2.6	5	5	5	1	3	...	...
Rhinitis.....	6	.8	3	...	...	3	...	...	...
Total diseases respiratory system.....	206	25.8	66	55	36	25	7	5	7
Diseases of the digestive system:									
Tonsillitis.....	21	4.4	7	2	...	11	...	...	...
Pharyngitis.....	14	...	9	2	2	...	...	...	1
Gastritis.....	15	1.9	8	1	4	1	...	1	...
Hernia.....	26	3.3	5	8	8	3	...	...	...
Total diseases digestive system.....	76	9.5	29	13	14	15	...	1	1
Diseases of the genito-urinary system:									
Nephritis.....	2	.3	1	1	...	...	...	...	...
Diseases of the skin:									
Acne.....	23	...	6	7	1	6	2	...	...
Eczema.....	16	...	6	2	5	3	...	...	...
Ulceration.....	6	...	...	...	...	...	...	...	...
Scabies.....	4	...	7	6	...	5	1	...	1
Other skin diseases.....	10	...	...	...	...	...	...	...	...
Total skin diseases.....	59	7.4	19	15	6	14	3	...	1
Diseases of the organs of locomotion:									
Flat foot.....	54	6.8	25	3	13	5	4	1	3
Total number of cases.....	842	...	308	144	182	135	19	16	17

\*Includes tuberculosis suspects. †Facial evidence only. ‡Includes 5 cases palpitation, enlargement, 2 muffled action, 1 pericarditis, 1 atheroma of aorta. §Includes 104 bakers

## VII

## EXAMINATION OF 800 BAKERS IN NEW YORK CITY

American	Other Nationalities	AGES			NUMBER OF YEARS IN TRADE			AGE ON ENTERING TRADE			MARITAL CONDITION	
		Under 16 years	16-44 years	45 years and over	Under 1 year	1-5 years	Over 5 years	Under 16 years	16-20 years	Over 20 years	Married	Single
10	30	3	684	113	24	53	723	7466	195	139	612	188
4	18	.....	292	55	19	22	306	220	70	48	263	84
6	12	3	392	58	5	31	417	246	125	91	349	104
.....	1	.....	16	3	1	3	15	7	4	8	16	3
.....	3	.....	29	18	.....	.....	47	28	7	12	39	8
3	2	2	163	18	5	15	163	106	41	36	140	43
.....	2	.....	3	.....	.....	1	2	1	1	1	2	1
3	6	2	211	39	6	19	227	142	53	57	197	55
.....	1	.....	77	6	.....	3	80	49	19	15	46	37
.....	.....	.....	9	.....	.....	1	8	4	2	3	8	1
.....	.....	.....	5	1	.....	1	5	1	2	3	4	2
.....	1	.....	91	7	.....	5	93	54	23	21	58	40
1	.....	.....	47	7	1	2	51	30	15	9	44	10
.....	1	.....	34	7	.....	1	40	29	7	5	38	3
1	1	.....	81	14	1	3	91	59	32	4	82	13
2	1	2	148	27	3	10	164	100	36	41	139	38
.....	.....	.....	2	.....	.....	.....	2	1	1	.....	2	.....
1	1	.....	12	9	.....	.....	21	14	2	5	20	1
.....	.....	.....	6	.....	.....	.....	6	3	1	2	4	2
3	2	2	168	36	3	10	193	118	40	48	165	41
.....	1	.....	19	2	1	3	17	14	4	3	15	6
.....	.....	.....	13	1	.....	.....	14	8	4	2	10	4
.....	.....	.....	14	1	.....	1	14	9	4	2	13	2
.....	2	.....	19	7	1	.....	25	15	2	9	24	2
.....	3	.....	65	11	2	4	70	46	14	16	62	14
.....	.....	.....	1	1	.....	.....	2	.....	1	1	2	.....
1	.....	.....	23	.....	1	4	18	13	9	1	9	14
.....	.....	.....	16	.....	.....	1	15	11	2	3	14	2
.....	2	.....	16	2	2	4	14	9	7	4	12	8
1	.....	2	55	2	3	9	47	33	18	8	35	24
.....	.....	.....	45	9	.....	1	53	39	10	5	48	6
8	13	6	717	119	15	51	776	498	191	160	649	193

15 rapid action, 15 murmur, 5 endocarditis, 4 arteriosclerosis, 4 regurgitation, 2 cardiac who have been over 30 years in the trade. ¶ In detail.

bakers dying from all causes is not the true criterion of the general mortality rate of all the bakers.

Leclerc de Pulligny notes "that the special death rate of bakers in the cities is affected by the fact that among these are also included the master bakers, who, as a rule, succeed in preserving their health in spite of the dangers of their trade." (29.)

According to Tatham (27), the general mortality figure of bakers in England was 177, while that of agriculturists was 100. Here, too, as in many of the other statistics, bakers are grouped with confectioners, who, as a rule, work under better conditions and are not so affected by their trade.

The general mortality rate of bakers and confectioners, as well as the mortality rate from special causes has been discussed in detail in Frederick Hoffman's article, Bulletin No. 82, Department of Labor. (24.) The following are Hoffman's comments on the subject:

"In 1900 the number of bakers and confectioners reported in the registration States was 39,181, among whom there occurred 483 deaths from all causes, or 12.3 per 1,000. The death rates by divisional periods of life were slightly higher for bakers at all ages except 25 to 34. The differences were not marked, or, to be specific, at ages 25 to 44, the rates were 7.9 for bakers, against 8.4 for males in the manufacturing and chemical industries. At ages 45 to 64 the rates were 23.4 and 20.2, respectively; and at ages 65 and over, 105.8 for bakers and confectioners, and 105.4 for males in the manufacturing and mechanical industries. The mortality from consumption among bakers was 2.5 per 1,000; from pneumonia, 1.2, and from other diseases of the respiratory system, 0.4. In commenting upon the mortality, it is stated in the census report that:

"The highest death rates (per 100,000) of bakers and confectioners were due to consumption (250.1), diseases of the urinary organs (145.5), diseases of the nervous system (160.8), and pneumonia (117.4), but the rates due to all of these diseases except diseases of the urinary organs were lower than the average rates in this class. The rates from diseases of the liver (45.9) and other diseases of the digestive system (58.7) were much higher than the average rates from these diseases in this class."

The Rhode Island vital statistics for bakers for the period 1852 to 1906 include 221 deaths from all causes, and of this number 44, or 19.9 per cent, were from consumption. During the decade ending with 1906 there occurred 86 deaths from all causes, of which 15, or 17.4 per cent, were from consumption. Of the mortality from other respiratory diseases, 2.3 per cent were deaths from asthma, and 9.3 per cent deaths from pneumonia, a total of 29 per cent of deaths from diseases of the lungs and air passages.

The recorded industrial insurance mortality statistics of bakers include 1,357 deaths from all causes, of which 277, or 20.4 per cent, were from consumption. Of the mortality of bakers from respiratory diseases other than consumption, 124 were from pneumonia, 23 from bronchitis, 17 from asthma, and 21 from less frequent respiratory diseases. If the deaths from consumption and from other respiratory diseases are combined, it is found that 34 per cent of the mortality of bakers are from the diseases of the lungs and air passages. The number of deaths of bakers under consideration is exceptionally large and strictly representative of this important occupation. The excess in the consumption mortality of bakers is clearly brought out in the tabular presentation of the proportionate mortality from this disease by individual periods of life, it being excessive at all ages below 65, but most so at ages 25 to 34, when, out of every 100 deaths from all causes, 42.8 were from consumption, against a normal expected proportion of 31.3.

The preceding observations and mortality statistics, included in the insurance experience, are much at variance with each other, and do not entirely warrant definite conclusions. It is somewhat open to question how the general official statistics are impaired in value by the inclusion of confectioners, who are, probably, less exposed to flour and other organic dust than bakers. The most convincing statistics are those for Switzerland, and the industrial insurance experience data, both of which indicate an excess in the degree of consumption frequency, although not at identical periods of life. Taking all the facts, however, into careful consideration, *they would seem to warrant the conclusion that consumption is of more frequent occurrence among bakers than among occupied males generally*, and that the degree of excess in consumption frequency is partly the result of continuous and considerable inhalation of flour

dust. The *mortality rate* is also *affected by the general conditions under which the work of a baker is carried on, including excessive hours, unsanitary conditions of bake-shops, night work, etc.* The occupation is exceedingly important, both as regards the baker himself and the public at large, and a further and more thorough investigation into the mortality of this occupation would be a most valuable contribution to industrial hygiene."

*General Morbidity, and Morbidity Rate from Special Diseases:*

As already noted in Hoffman's statistics, the number of bakers dying from tuberculosis, respiratory and other diseases, is quite high. This is in conformity with the well-known prevalence of certain diseases among bakers.

Our medical inspection of 800 bakers seems to confirm the fact that bakers are specially liable to some diseases more than to others.

*Respiratory Diseases:*

Of the 800 bakers examined, 177 were suffering from acute or chronic bronchitis; 2 from sub-acute pleurisy, 21 from asthma and emphysema, and 6 from chronic rhinitis, in all 206, or 25 per cent of all the bakers suffered from some form of respiratory disease, 22.1 per cent from bronchitis alone. This rate is very much higher than in any other trade, and is probably due to bad ventilation in bakeries, to the draughts, to the high temperatures and relatively high humidity in bakeries.

The prevalence of bronchitis among bakers was commented upon over 200 years ago by Rammazzini. (15.) Of the 1,000 members of the Bakers' Union in Vienna in 1890-3, there was an average sickness from respiratory diseases yearly, 102, of which 58 suffered from acute and chronic bronchitis, with a general morbidity rate from respiratory diseases of 38.8 per cent. (28.) Epstein also remarks upon the occurrence of chronic rhinitis among bakers, and he also ascribes chronic bronchitis among bakers to the constant inhalation of bad air, flour, dust, etc.

The mortality rate of bakers from consumption has already been referred to in the extract from Hoffman's article. In our examination only a little less than 2.4 per cent were found to suffer from tuberculosis. This rate is probably not greater than among



workers of other trades, although it is possible and highly probable that a number of those who were stated by the physicians to be suffering from chronic bronchitis had either incipient or marked tuberculosis infection, a fact that could not be determined in a cursory examination.

On the other hand, statistics from Italy, Rome, Berlin, Leipzig, do not show a high percentage of bakers suffering from tuberculosis.

Epstein, however, examined 98 bakers and found among them 32 suffering from tuberculosis. (28.)

The general morbidity rate of bakers is very high according to the results of our examination. Of the 800 bakers examined, 206 were suffering from respiratory diseases, 50 from digestive diseases, 59 from skin diseases. In all there were only 347, or 43 per cent, of the men who were free from any pathological condition.

Bakers are notoriously pale. 183 were strikingly anaemic, according to our physicians. This prevalence of anaemia among bakers confirm statements made by other observers. According to investigations made by Epstein of 183 bakers, one-sixth had a lower hemoglobin count than usual. Epstein thinks that the paleness of bakers does not depend so much upon the decreased percentage of hemoglobin, as upon their infection with tuberculosis. (28.)

Of the circulatory diseases found among the 800 examined, there were 54 or 6.8 per cent with distinct cardiac lesions. This is also in conformity with the finding of others.

There are a comparatively large number of eye diseases (11.5 per cent), which are chiefly due to work done in cellars, in front of ovens, with artificial light, and in dusty atmosphere.

The large percentage of hernia, 9.5, is also noted in all other examinations of bakers, as well as the prevalence of flat feet. (6.8 per cent.)

Of diseases of the skin, there were 59, or 7.4 per cent, suffering from scabies. A distinctly occupational disease is "baker's itch." Eczema is also very frequent among workers in bakeries.

The prevalence of infectious skin diseases is an additional reason that workers who handle the bread products should be periodically examined, and that workers suffering from these diseases should be isolated.

Our physical examination of 800 bakers, incomplete as it was, and incomplete as is our tabulation, seems to confirm all previous investigations made abroad and in this country, and also confirms the general statement as to the evil effects of unsanitary conditions of the bakeries upon the health of the workers in the trade, and the need of remedial measures to remove these evils.

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## PART THIRD

### REMEDIES

The sanitary inspection of bakeries and the physical examination of bakers, as well as the opinions of the authorities and commissions, all prove that very serious evils exist in this important industry, evils which are a menace to the lives of the workers as well as to the health of the great consuming public. What, then, are the remedies? Are remedies possible? Can bakeries be made sanitary? Can the industry be conducted under hygienic conditions? If remedies are imperative, shall they be applied from within by a reform of the industry itself, or from without by concerted public and legislative action?

There cannot be any doubt that conditions are too grave to leave things alone until such a time as the industry reforms from within. Consideration of the health of the workers and of the community demands speedy and immediate action to at least ameliorate the worst evils existing in the trade. It is, therefore, imperative to apply legislative remedial measures in the interests of the public health.

What direction should legislative action take? What restrictions are needed, and what regulation is necessary to begin with?

A study of the subject will lead us to the deduction that remedial legislation in regard to bakeries must be in the following four directions.

- (1) Abolition of Cellar Bakeries.
- (2) Licensing of Industry.
- (3) Strict Supervision by the State.
- (4) Medical and Physical Examination.

*Abolition of Cellar Bakeries:*

No remedial legislation will be of any avail which does not prevent the location of this trade in underground cellars. This is the first principle upon which all efforts to lessen the evils of unsanitary bakeries must be based. It may be put down without fear of contradiction,— and this opinion is shared by all the health and factory officials interviewed,— that no bakery can ever be sanitary as long as it is located in a cellar.

A cellar is an unfit place for the manufacture of food stuffs, or for the habitation of workers. There cannot be any natural light in a cellar under the most favorable conditions, and no place can be sanitary that lacks sunlight. Cellars are the most difficult places to ventilate unless mechanical ventilation is installed, which is out of the question in the ordinary small bakery. Cellars in which bakeries are located cannot have a temperature which is healthy for workers; they are too near the ground and the emanation from the ground, and the ovens and the heated atmosphere needed for dough raising, make it almost impossible for cellar bakeries to have a moderate and equable temperature in the absence of proper ventilation. Cellars cannot be kept clean as other parts of the house, for they are semi-dark, contain most of the plumbing pipes and fixtures, and are, as a rule, the dumping ground of the whole house. Cellars are also the natural habitation of insects, rodents, etc., and are also in proximity to breeding places of flies, which are attracted to the food stuffs.

The abolition of cellar bakeries is, therefore, the first remedial legislation which suggests itself in any scheme of bakery reform.

Of course, there are rare exceptions, as already noted, where a cellar may not be absolutely unsanitary, but they are so rare as to be negligible.

The question which naturally comes up next is whether the use of cellars should be prohibited at once, or whether this reform should be carried out gradually?

In all propositions to abolish serious evils, the argument is brought up that a large class of persons will suffer great hardship if conditions are changed. But this hardship is inevitable, and has been urged against all progressive steps in civilization from the introduction of machinery and railroads to the introduction of motor cars.

There is, however, the possibility of gradually abolishing cellar bakeries without inflicting too great hardships upon those engaged in the work, by prohibiting any further bakeries from locating in cellars and by raising the standards for existing bakeries so that the extensive alterations required will gradually drive the trade out of its subterranean habitations.

### *Licensing of Industry:*

There are a number of industries to which the principle of state or municipal licensing has been already applied. These industries have one or more features which make their control needed in the interest of public health. They are either dangerous to life because of the intrinsic perils of the materials and processes (explosive fireworks), or they may become a nuisance to the neighbors (offensive trades, stables, keeping of animals, rendering of animal matters), or they are trades that bear an intimate relation to the public health (plumbing, dairy industry, slaughter houses, etc.).

The bread-making industry is surely one that is closely related to public health, and is one of the principal food industries to which the licensing principle should be applied.

The licensing of the bakeries, as well as all other places where food products are manufactured, is a public health measure, as has practically been agreed by all employers and workers appearing before the Commission.

The licensing of bakeries, etc., would imply a previous thorough sanitary inspection of the place before granting the license, and also the revocation of the license for infringement of the rules and regulations laid down as a minimum standard for this industry.

The licensing of all bakeries in all cities is the immediate step in all remedial legislation, and the trade, the workers, and the whole public are not only ready for it, but are anxious to have it an accomplished fact.

The question of the Department under whose jurisdiction this licensing of the bakeries should fall is a more difficult one. The subject, in view of the relation of the product to the consumer's health, lies naturally within the scope of the work of the Health Department, but it also belongs to the Labor Department because of the necessity for regulation of the labor conditions. Some divi-

sion of functions may be possible, such as putting of the licensing in the hands of the Labor Department, with the requirement of a sanitary certificate from the local health officials before the Department can issue the license.

### *Regulation of Conditions:*

A licensing system is of no value unless definite standards are set for the trade, and a provision made for the revocation of the license. While the detail of such standards may be left to the discretion of the Labor Commissioner, there are certain definite minimum sanitary standards which should be defined by law. Some tentative standards are suggested below. There is only one necessary comment to make in respect to night work. While the sentiment of the public and of the workers is not as yet strong enough to abolish night work in this country, the question of night work and its effects upon the health of the workers is very important from a hygienic standpoint, since healthy products cannot very well be prepared by unhealthy workers.

The regulation of the hours of labor is a most necessary function of the State, and I believe there has been accumulated during the last few years sufficient evidence to show that a regulation of the hours of bakers to sixty per week, or even less, will be no infringement of the most sacred right, "freedom of contract," for it will be in the interest of public health, and is, therefore, a just exercise of the police power of the State.

Simultaneously with a legal maximum of weekly and daily hours of labor, a law is needed to regulate night work, by making a shorter (eight hour) period for all night work. Such a legal regulation seems to be most desirable in the interests of the industry, the workers and the public health.

### *Physical Examination:*

A system of medical examination of employees entering the trade has already been introduced into many industries, and all civil service positions require a more or less rigid medical examination. Many private corporations, such as railroads, telegraph companies, stores and certain other industrial establishments require a previous physical examination.

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#### SUGGESTED MINIMUM STANDARDS FOR BAKERIES.

(1) After a certain date no new bakeries shall be located in any cellar, nor shall any cellar, once vacated, be again occupied as a bakery.

(2) The owners of all existing bakeries shall be required to obtain a license from the State Labor Department. No bakery shall be conducted within the State without a proper license from the Labor Department.

(3) The Commissioner of Labor shall upon application of an owner of a bakery for a license, cause an inspection to be made of the premises, to determine the compliance with all the rules of the Department and of the Labor Law, and shall issue such license under additional certificate of the Local Department of Health or Health Officers, certifying that all sanitary conditions as to the manufacturing of food products have been complied with.

(4) Said license shall be good for one year after date of issue, and shall be renewed annually only upon an inspection, and shall be revocable for cause at any time.

(5) The hours of labor in all bakeries for all workers therein shall be limited to a maximum of ten hours in every 24 hours, and to 60 hours per week of seven days.

(6) No female worker under 21 and no minor under 18 shall be permitted to work more than 8 hours per day, 48 hours per

week, nor shall they be permitted to work between the hours of 7 P. M. and 6 A. M.

(7) Every employee in a bakery shall be required by the owner thereof to present a certificate from a reputable physician, said certificate to state that a physical examination has been made, and that he is free from any disease that would endanger the public health while working at his trade.

Work falling wholly or in part between the hours of 8 P. M. and 6 A. M. shall be considered night work, and shall be limited to 8 hours in every 24 hours.

(8) No room can be used as a bakery or work room in a bakery in which artificial light is needed during the whole day. One window shall be required, said window to be at least 15 square feet in area.

(9) A window space in a bake or work room shall not be less than one-fifth of the floor space of such rooms.

(10) At least 450 cubic feet of area space, and 50 square feet of floor space shall be allowed for every person employed therein.

(11) Every bakery shall be provided with ventilating fans, or in lieu of such fans, chimneys may be arranged so as to ventilate bakery properly.

(12) All windows shall be so arranged that they can be easily opened for the purpose of ventilation.

(13) In every bakery the space where the bake oven is located shall be partitioned off by a fire-proof partition dividing it from the rest of the work rooms.

(14) The walls and ceilings of all rooms in the bakery shall be plastered and cemented, and shall be painted in a light color or calsomined with lime, such surface to be cleaned as often as ordered by Commissioner of Labor.

(15) No wooden floors shall be permitted in any part of the bakery. All floors must be level and smooth and be made of non-absorbent material and be cleaned daily and kept clean at all times.



(16) All posts, columns, beams, etc., exposed within any part of the bakery shall be covered with sheet metal and painted over with light-colored paint.

(17) All windows and doors opening in any part of the bakery shall be screened with copper wire screens with meshes sufficiently close to prevent flies and other insects from entering through same.

(18) Every bakery shall be equipped with a sufficient supply of pure running water and shall be provided with at least one sink or wash-basin for every ten employees, and provision shall be made for a supply of hot water.

(19) No sink or wash-basin or any fixture within the bakery shall be enclosed with wood work, said sink or wash-basin to be kept in a sanitary condition at all times.

(20) Suitable dressing rooms, or places where workmen can change their clothes shall be provided in every bakery, and every employee in a bakery while at work shall be provided by the owners, free of cost, suitable caps, slippers, overalls or aprons, which shall be laundered at least twice a week, or oftener if necessary, free of cost to the employee.

(21) No chewing tobacco or spitting on floors in bakeries shall be permitted, nor shall smoking be permitted to the employees while at work.

(22) No person shall be permitted to sleep in any part of a bakery, or in rooms where flour or meal used in connection therewith, or where any food products are handled or stored.

(23) Cuspidors of impervious material shall be provided, and cleansed daily.

(24) No water-closets or urinals shall be permitted in any bake shop or bake rooms. All such fixtures shall be placed in separate departments provided with a window to the outer air, and provided with artificial illumination wherever it is necessary.

(25) All utensils used in a bakery, and all places upon which the unfinished or finished materials are placed or stored shall be

made of such material as may readily be cleaned and shall be kept clean at all times.

(26) All flour, starch, sugar and all other products used in the process of baking shall be stored either on platforms or shelves or shall be kept in covered metal barrels or receptacles so as to be clean and free from all dust and dirt.

(27) No domestic animals shall be permitted in any part of a bakery. All rooms of the bakery shall be free of insects, vermin, etc.

(28) All persons working in a bakery who handle or touch the products therein shall wash their hands and arms in clean water before beginning work, and every time they change from one kind of work to another.

(29) They shall have their finger nails cleaned, and shall be free from skin disease, or any infectious diseases.

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## DEPARTMENT OF HEALTH

### BAKERY ORDINANCE OF THE CITY OF CHICAGO, 1910

*Be it ordained by the City Council of the City of Chicago:*

SECTION 1. Any place used for any process of mixing, compounding, or baking, for sale or for purposes of a restaurant, bakery or hotel, any bread, biscuits, pretzels, crackers, buns, rolls, macaroni, cake, pies, or any food product of which flour or meal is a principal ingredient, shall be deemed a bakery for the purpose of this ordinance; provided that licensed restaurants in which any of the foregoing food products are mixed and baked for consumption in such restaurant only, on or in ordinary restaurant kitchen stoves or ranges, and kitchens or rooms in dwellings where any of the said food products are mixed and baked in an ordinary kitchen stove or range, shall not be considered bakeries.

SEC. 2. No person, firm or corporation shall establish, maintain or operate any bakery without first having been licensed so to do by the city. Every person or corporation establishing, maintaining or operating any such bakery shall annually, on the first

day of May of each year, pay a license fee of five (\$5.00) dollars for a license for each bakery so maintained, which license shall be issued for a period ending with the first day of May following; provided, however, that upon furnishing proof to the City Collector that the applicant was not liable for a license fee and did not maintain a bakery without a license prior to the date of his application and after the taking effect of this ordinance, a license may be issued for the unexpired license period, and in such case the license fee shall be five (\$5.00) dollars for any such unexpired period which is greater than six months, and two dollars and fifty cents (\$2.50) for any such unexpired period which is equal to or less than six months. Provided, further, that no person, firm, or corporation now holding a license which by its terms will expire on May 1, 1910, shall be required to take out any other bakery license or pay any additional bakery license fee under this ordinance prior to May 1, 1910.

SEC. 3 Any person or corporation desiring to establish, maintain or operate a bakery, as defined in this ordinance, shall make application in writing to the Commissioner of Health for a license so to do. Such application shall set forth the name and residence of the applicant if an individual, and the names and residences of the principal officers of the applicant, if a corporation, together with the location of the place for which such license is desired.

SEC. 4. Within ten days after the receipt of such application, it shall be the duty of the Commissioner of Health to make or cause to be made an examination of the place described in such application, for the purpose of ascertaining whether the location, lighting, ventilation, sanitary arrangements and equipment of such bakery conform to the provisions of this ordinance. If the proposed bakery conforms to the provisions of this ordinance, the Commissioner of Health shall transmit such application to the Mayor with his approval thereof, whereupon the Mayor shall issue or cause to be issued to such applicant, upon payment to the City Collector of the license fee hereinbefore provided, a license authorizing such applicant to keep, conduct or maintain a bakery at the place described in such application for and during the period of such license.

SEC. 5. If at any time during the term of such license the Commissioner of Health shall certify to the Mayor that the provisions of the ordinance have not been or are not being complied with, or that the public health or the health of the persons employed in any such bakery is endangered by its maintenance, the Mayor may revoke the license thereof.

SEC. 6. Every such license granted under the provisions of this ordinance shall be posted in a conspicuous place in the bakery for which such license is issued.

SEC. 7. Every place used as a bakery shall be kept in a clean and sanitary condition as to its floors, side walls, ceilings, wood-work, fixtures, furniture, tools, machinery and utensils. All parts of the bakery shall be adequately lighted at all times, and shall be ventilated by means of windows or skylights or air shafts or air ducts or mechanical apparatus, if necessary, so as to insure a free circulation of fresh air at all times. Such ventilating construction and equipment shall be of such character that a complete change of air in all parts of the bakery may be made at least four times each hour. Provided, however, that it shall not be necessary to ventilate at such time or in such manner that the process of mixing or rising of dough shall of necessity be interfered with or prevented.

SEC. 8. The floor of every place used as a bakery, if below the street level, shall be constructed of concrete, cement, asphalt or other impervious material, or of tile laid in cement, which floor may, if desired, be covered with a hardwood floor having tight joints; if above the street level the floor may be of hardwood with tight joints or may be of any impervious material, as above provided. The angles where the floor and walls join shall be made and maintained so as to be rat-proof.

SEC. 9. Every bakery shall be kept reasonably free from flies, and the doors, windows, and other openings of every such bakery shall, from April 1 to December 1, be fitted with self-closing wire screens doors and wire window screens. The side walls and ceil-

ings shall be well and smoothly plastered, tiled or sheathed with metal or wood sheathing, and shall be kept in good repair. If made of mill construction with smooth surfaces such walls and ceilings need not be sheathed or plastered.

All walls and ceilings shall be kept well painted with oil paint, or lime washed or calcimined, and all woodwork shall be kept well painted with oil paint.

SEC. 10. Every such bakery shall be provided with adequate plumbing and drainage facilities, including well ventilated water closets and impermeable wash sinks on iron supports. No water closet compartment shall be in direct communication with a bakery.

SEC. 11. No person shall sleep in any bakery or in the rooms where flour or meal used in connection therewith, or the food products made therein, are handled or stored. If any sleeping places are located on the same floor as the bakery, they shall be well ventilated, dry and sanitary. No domestic animals except cats shall be permitted in a bakery or place where flour or meal is stored in connection therewith, and suitable provision shall be made to prevent nuisances from the presence of cats.

SEC. 12. All workmen and employees while engaged in the manufacture or handling of bakery products in a bakery shall provide themselves with slippers or shoes and a suit of washable material which shall be used for that purpose only. These garments shall at all times be kept clean.

SEC. 13. Cuspidors of impervious material shall be provided and shall be cleansed daily. No employe or other person shall spit on the floor or side walls of any bakery or place where food products of such bakery are stored.

SEC. 14. The smoking, snuffing or chewing of tobacco in any bakery is prohibited. Plain notices shall be posted in every bakery forbidding any person to use tobacco therein or to spit on the floor of such bakery.

SEC. 15. No person who has consumption, scrofula or venereal diseases or any communicable or loathsome skin disease shall work

in any bakery, and no owner, manager or person in charge of any bakery shall knowingly require, permit or suffer such a person to be employed in such bakery.

SEC. 16. All rooms for the storage of flour or meal for use in connection with any bakery shall be dry and well ventilated, and every bakery and room used for the storage of materials and food products in connection therewith shall be so arranged that the shelves, cupboards, trays, troughs, bins, cases and all other appliances for handling and storing the same can be easily removed and cleaned. If the floor of any such bakery or room is below the adjacent street level, no such materials or products shall be stored nearer to such floor than one foot.

SEC 17. Every bakery shall be kept clean at all times and free from rats, mice and vermin and from all matter of an infectious or contagious nature.

SEC. 18. No new bakery shall be established after the passage of this ordinance in any room, basement or cellar in which the clear height between the finished floor and ceiling is less than 8 feet 6 inches or in any room or place the floor of which is more than 5 feet below the street, sidewalk or alley level adjacent to the building, or in any room or place which is not so naturally lighted by means of windows, doors or skylights that on clear days a book or paper printed with double long primer type can be read between the hours of 10 a. m. and 2 p. m. in all parts of the bakery which are used in mixing or handling bakery products.

If any new bakery hereafter established has its floor above, at, or not more than 3 feet below the adjacent street or alley level, no window opening by which it is ventilated shall be less than 3 feet above such street or alley level; if the floor of any such bakery is more than 3 feet below the adjacent street or alley level, no such window opening shall be less than 18 inches above such street or alley level.

In new bakeries hereafter established, no water closet compartment shall be connected with the bakery by a vestibule connection.

SEC. 19. If any bakery which is now being maintained and operated shall be vacated, discontinued or unused for a period of more than six consecutive months and shall thereafter be reopened and re-established as a bakery, such bakery shall be considered a new bakery for purposes of this ordinance.

SEC. 20. The Commissioner of Health and the authorized inspectors and employees of the Department of Health shall have the right at all times to enter to make such inspection and such record of the condition of any bakery as they may deem necessary, and if such inspection shall disclose a lack of conformity with this ordinance, the Commissioner of Health may require such changes, alterations or renovations as may be necessary to make such bakery comply with the provisions of this ordinance.

SEC. 21. Any person, firm or corporation who shall establish, maintain or operate any bakery after this ordinance shall take effect, without first procuring a license so to do, shall be fined not less than twenty-five (\$25.00) dollars nor more than two hundred (\$200.00) dollars for each offense, and a separate offense shall be regarded as committed each day on which such person, firm or corporation shall maintain or operate any bakery without a license as aforesaid.

Any person, firm or corporation who violates or fails to comply with any other provision of this ordinance shall be fined not less than five (\$5.00) dollars nor more than one hundred (\$100.00) dollars for each offense, and a separate offense shall be regarded as committed each day on which such person, firm or corporation shall continue any such violation or failure.

SEC. 22. An ordinance entitled "Bakery Ordinance of the city of Chicago," passed by the City Council on the 11th day of November, A. D. 1907, as amended June 22, A. D., 1908, is hereby repealed.

SEC. 23. This ordinance shall take effect from and after its passage and due publication.

Passed February 28, 1910.

STATE OF RHODE ISLAND AND PROVIDENCE  
PLANTATIONS

JANUARY SESSION, A. D. 1910

AN ACT IN AMENDMENT OF AND IN ADDITION TO CHAPTER 78  
OF THE GENERAL LAWS, 1909, ENTITLED "OF FACTORY IN-  
SPECTION."

*It is enacted by the General Assembly as follows:*

SECTION 1. Section 3 of Chapter 78 of the General Laws 1909, entitled "Of Factory Inspection," is hereby amended so as to read as follows:

"SEC. 3. The governor shall, upon the passage of this act, and in the month of January of every third year hereafter, appoint, with the advice and consent of the senate, one chief and three assistant factory inspectors, one of whom shall be a woman, whose term of office shall be three years or until their successors shall be so appointed and qualified: *Provided*, that the term of office of the present factory inspectors shall not be changed, and that the term of office of the additional factory inspector provided in this act shall expire in January, A. D. nineteen hundred and eleven, or upon the appointment and qualification of his successor. Any vacancy which may occur in said offices when the senate is not in session shall be filled by the governor until the next session thereof, when he shall, with the advice and consent of the senate, appoint some person to fill such vacancy for the remainder of the term. Said inspectors shall be empowered to visit and inspect, at all reasonable hours and as often as practicable, the factories, work-shops, and other establishments in this state subject to the provisions of this chapter, and shall report to the General Assembly of this state at its January session in each year, including in said reports the name of the factories, the number of such hands employed, and the number of hours of work performed in each week. It shall also be the duty of said inspectors to enforce the



provisions of this chapter and prosecute all violations of the same before any court of competent jurisdiction in the state.

"The name and residence of any child found working without the certificate provided for in section one of this chapter shall be reported by the chief inspector to the school committee in the city or town where such child resides. Said inspectors shall devote their whole time and attention to the duties of their respective offices, under the direction of the chief inspector. The annual salary of the chief inspector shall be two thousand dollars; and each of the assistant inspectors, fifteen hundred dollars."

SEC. 2. Section 4 of said Chapter 78 of the General Laws is hereby amended so as to read as follows:

"SEC. 4. All necessary expenses incurred by such inspectors in the discharge of their duty shall be paid from the funds of the state, upon the presentation of proper vouchers for the same approved by the governor: *Provided*, that not more than twenty-three hundred dollars in the aggregate shall be expended by the said inspectors in any one year."

SEC. 3. Said Chapter 78 of the General Laws is hereby amended by adding the following sections:

"SEC. 18. Said chief inspector, or any assistant factory inspector required by him, shall have charge of the inspection of bakeries, confectioneries, and ice cream manufactories, and any premises upon which bread or other products of flour or meal are baked or mixed or prepared for baking or for sale as food, in this state; and any such inspector so acting, whether one or more of such inspectors, or whether acting at the same or different times, shall for such purposes be designated as a state inspector of bakeries, confectioneries, and ice cream manufactories. Such inspector shall not be pecuniarily interested, directly or indirectly, in the manufacture or sale of any article or commodity used in any business included in the provisions of this act, and shall not give certificates or written opinions to a maker or vendor of any such article or commodity.

"SEC. 19. No person, copartnership, or corporation shall carry on the business of a public bakery, confectionery, or ice cream manufactory, or place where bread or other products of flour or meal are baked or mixed or prepared for baking or for sale as food, until such premises are inspected by said state inspector. If such premises be found to conform to the provisions of this act, said inspector shall issue a certificate to the owner or operator of such bakery, confectionery, or ice cream manufactory, or place where flour or meal food products are baked or mixed or prepared for baking or for sale as food. Every person, copartnership, or corporation carrying on such business shall, upon the granting of such license, and annually on the first day of January thereafter, pay to the general treasurer a license fee of ten dollars if conducting such a wholesale business, and a license fee of three dollars if conducting only such a retail business.

"SEC. 20. All buildings or rooms used or occupied as biscuit, bread, macaroni, spaghetti, pie or cake bakeries, ice cream or confectionery manufactories, or where flour or meal food products are baked or mixed or prepared for baking or for sale as food, shall be drained and plumbed in a manner conducive to the proper and healthful sanitary condition thereof, and shall be constructed with air shafts, windows, or ventilating pipes sufficient to insure adequate and proper ventilation. No cellar, basement, or place which is below the street level shall hereafter be used or occupied for the purposes mentioned in this section: *Provided*, that the same may be so used or occupied by the present occupant only.

"SEC. 21. Every room used for the purposes included in this act shall have, if deemed necessary by such inspector, an impermeable floor constructed of cement, or of tiles laid in cement, or of wood or other suitable non-absorbent material which can be flushed and washed clean with water. The side walls and ceilings of such rooms shall be plastered or wainscoted; such inspector shall require said premises to be kept at all times in a sanitary condition; he may also require the woodwork of such walls to be well oiled, varnished, or painted. The furniture and utensils shall be so arranged as to be readily cleansed and not prevent the proper cleaning of any part of the room.

“ The manufactured flour or meal food products shall be kept in dry and airy rooms, so arranged that the floors, shelves, and all other facilities for storing the same can be properly cleaned.

“ No domestic animals except cats shall be allowed to remain in a room used as a biscuit, bread, pie, or cake bakery or any room in such bakery where flour or meal products are stored or kept.

“ SEC. 22. Every such bakery, confectionery, or ice cream manufactory, or place where flour or meal food products are baked or mixed or prepared for baking or for sale as food, shall be provided with a proper wash-room and water-closet, or water-closets, apart from the bake-rooms or rooms where the manufacture of such food products is conducted, and they shall be maintained in a sanitary condition; no water-closet, earth-closet, privy, or receptacle for garbage shall be within or connect directly with the bake-room of any bakery or room where ice cream or confectionery is manufactured. Operatives, employees, clerks, and all persons who handle the material from which food is prepared, or the finished product, before beginning work, or after visiting toilet or toilets, shall wash their hands and arms thoroughly in clean water.

“ No person shall sleep in a room occupied as a bake-room. Sleeping places for the persons employed in the bakery shall be separate from the rooms where flour or meal food products are manufactured or stored. If the sleeping places are on the same floor where such products are manufactured, stored, or sold, such inspector may inspect and order them put in a proper sanitary condition.

“ SEC. 23. No bakery, confectionery, or ice cream manufactory, or place where flour or meal food products are baked or mixed or prepared for baking or for sale as food, shall be conducted in a room adjoining a stable, unless separated from such stable by a wall or partition without any door or other opening between such stable and such bakery, confectionery, or manufactory, or place where flour or meal food products are baked or mixed or prepared for baking or for sale as food; and no material used therein shall be kept in a stable.

"SEC. 24. Packages or receptacles containing butter, lard, cooking oils, molasses, sugar, spices, dried fruits, tartars, and similar articles, in such bakery, confectionery, or manufactory, or place where flour or meal food products are baked or mixed or prepared for baking or for sale as food, must be kept covered when not necessarily uncovered for use.

"SEC. 25. Smoking, snuffing, or chewing of tobacco, or spitting on floor in working rooms in such bakery, confectionery, or manufactory, or place where flour or meal food products are baked or mixed or prepared for baking or for sale as food, is strictly forbidden.

"SEC. 26. No employer in any bakery, confectionery, or ice cream manufactory, or place where flour or meal food products are baked or mixed or prepared for baking or for sale as food, shall require, permit, or suffer any person to work, nor shall any person work, in a building, room, basement, cellar, or vehicle occupied or used for the production, preparation, manufacture, packing, storage, sale, distribution, and transportation of food, who is affected with any venereal disease, smallpox, diphtheria, scarlet fever, yellow fever, tuberculosis or consumption, bubonic plague, Asiatic cholera, leprosy, trachoma, typhoid fever, epidemic dysentery, measles, mumps, German measles, whooping-cough, chicken pox, or any other infectious or contagious disease.

"SEC. 27. Bread or pastry must not be laid on the floor in such bakery, confectionery, or manufactory, or place where flour or meal food products are baked or mixed or prepared for baking or for sale as food. No label shall be stuck on bread or other bakery goods by means of gum, saliva, or any material other than the article baked. No baker shall use or cause to be used newspapers or other second-hand paper for the purpose of lining tins or wrapping up bread or other bakery goods. All bakers' wagons must be kept clean, both inside and out, and so arranged that no dust can blow on bread or pastry while in transit.

"SEC. 28. Bakeries, confectioneries, and ice cream manufactories, or places where flour or meal food products are baked or

mixed or prepared for baking or for sale as food, shall be kept at all times in a clean and sanitary condition, and shall be inspected by said inspector at least twice each year. If on inspection said inspector finds any bakery, confectionery, or ice cream manufactory, or place where flour or meal food products are baked or mixed or prepared for baking or for sale as food, to be so unclean, ill-drained, or ill-ventilated as to be unsanitary, he may, after such reasonable time, to be fixed by said inspector, not less than five days, by notice in writing, to be served by affixing the notice on the inside of the main entrance door of said bakery, confectionery, or ice cream manufactory, or place where flour or meal food products are baked or mixed or prepared for baking or for sale as food, order the person found in charge thereof immediately to cease operating it until it be properly cleaned drained, or ventilated.

“SEC. 29. Any person who is aggrieved by any order or requirement of said state inspector may appeal therefrom in the same manner in all respects, and with the same rights and liabilities, as provided in section 10 of said Chapter 78 of the General Laws.

“SEC. 30. Any person who violates any of the provisions of said sections nineteen to twenty-eight, both inclusive, of said Chapter 78 of the General Laws, as herein amended, or refuses to comply with any lawful requirement of the authority vested with the enforcement of such sections, as provided therein, shall be guilty of a misdemeanor, and on conviction shall be punished by a fine of not less than twenty or more than fifty dollars for a first offense, and for a second offense by a fine of not less than fifty or more than one hundred dollars or by imprisonment for not more than ten days, and for a third offense by a fine of not less than one hundred or more than two hundred and fifty dollars or by imprisonment for not more than thirty days, or by both such fine and imprisonment.

“SEC. 31. Such inspector shall be empowered to visit and inspect all parts of stores, bakeries, confectioneries, and store-rooms and places where ice cream, flour and meal food products are

manufactured, at any and all reasonable times. Such inspector shall promptly enforce the provisions of this act, and shall prosecute all violations of the same before any court of competent jurisdiction in the state. The attorney-general shall act as his legal adviser in all matters pertaining to his official duties. He shall cause copies of this act to be printed and kept posted in all bakeries, confectioneries, and manufactories of ice cream, flour and meal food products, and all places where such business is carried on. Any mutilation of such printed matter shall be punished as provided in the preceding section. Such inspector shall not be required to give surety, nor furnish recognizance for costs, in any prosecution or proceeding under this act."

SEC. 4. This act shall take effect upon its *passage*: *Provided*, that any business included in the provisions of this act and now carried on may be carried on without the license required by the provisions of this act until August first, A. D. nineteen hundred and ten, and, in case application for such license be made prior to June first, A. D. nineteen hundred and ten and be not acted upon by such inspector prior to August first, A. D. nineteen hundred and ten, such business may be carried on without such license until said application is acted upon by such inspector.

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#### INDUSTRIAL COMMISSION OF WISCONSIN

(Successor to Bureau of Labor and Industrial Statistics.)

#### RULES RELATIVE TO BAKERIES AND CONFECTIONERIES.

The following is a list of tentative rules for the regulation of bakeries. These rules are proposed for adoption by the Industrial Commission. They may be modified by the Commission whenever, in its judgment, general or special conditions make such action desirable in order to attain the sanitary standard sought to be established by their adoption.

In submitting these rules to the bakers and confectioners of the state, the Industrial Commission invites criticisms and sug-

gestions. At the meeting of the Wisconsin Association of Master Bakers in Milwaukee Oct. 11, 1911, it is proposed to review this compilation and to make such changes as are considered desirable.

All rules or regulations adopted formally by the Industrial Commission have the full force of law, and violations are subject to the penalty provided.

#### DRAINAGE AND PLUMBING.

1. If there is a public drain in the village or city extending along any street or alley in which a bakery is located, the bakery must be connected with such drain.

2. If there is no public sewer or drain, then a drain must be provided to a cesspool or other receptacle, located at least thirty feet away from the bakery; provided that if such drain empties into a running stream or lake, the limitation as to distance shall not apply.

3. All plumbing must meet the legal requirements of the city or village where the bakery is located; but in all cases water fixtures shall be back-vented or equipped with anti-syphon trap.

4. Waste water shall not be drained directly on the ground below the floor nor on the surface of the ground adjacent to the bakery.

5. If there is any public or other sewer running through any bakery, the same shall be so securely and completely bedded as to prevent the escape of water, sewage, or gas, and must be subject to a test of at least two feet of water head or twenty-five pounds of air pressure.

6. No drain is permitted nearer than eighteen inches to any water service pipe.

#### WATER SUPPLY.

7. No water from a fixture located in any water closet shall be used for baking purposes.

8. Only clean, pure water shall be used, a sufficient supply of which shall be available at all times.

#### CONSTRUCTION OF ROOMS.

9. Side walls must be free from holes, ragged edges, cracks or crevices, and all joints must be tight and flush.

10. Floors must be level and smooth, and free from cracks or openings. All new wooden floors must be made of hard wood and treated with oil varnish.

11. Ceilings may be plastered or ceiled with metal or wood. In case ceilings are open joists, the exposed surfaces shall be planed; in concrete construction, the ceiling shall be smooth and shall be painted or whitewashed.

#### CARE OF ROOMS.

12. All plastered surfaces may be whitewashed. Others should be painted. *Whitewash must be renewed at least once in six months; paint at least once in two years.*

13. All floors in work and bakerooms must be swept clean every day and any adhering materials scraped off; sweepings must be deposited in an impermeable receptacle and removed or destroyed within twenty-four hours. All such floors must be scrubbed with soap and water at least once a week.

14. Floors and side walls in storage rooms must be cleaned whenever they become empty, before new stock is put in.

15. No cleanings, waste nor offal shall be deposited upon the floor of any bakery, but should be placed in proper receptacle which must be provided for that purpose.

16. If it is necessary to remove live coal or ashes out of ovens, the same shall be placed at once in iron receptacles and tightly covered. This work shall always be done in such manner that no ashes or gases shall escape into bakery.

17. Windows and window ledges must be washed and wiped whenever they become dirty.



17 b. No domestic animals shall be allowed in any room.

18. All inside painted surfaces in bakeries must be scrubbed with soap and water at least once in six months.

#### CONSTRUCTION OF UTENSILS.

19. Bread boxes and roll and bread boards shall be made of sound lumber, planed on all sides, smoothly joined, and free from cracks and crevices.

20. All work tables shall be made of sound, well-seasoned lumber, smoothly joined and free from indentations, cracks and crevices. Stone or metal-work tables may be used if desired.

21. All dough-troughs and pan or bread-racks must be mounted on casters or rollers so that same may be easily moved.

#### CARE OF UTENSILS.

22. Doughnut kettles must be kept covered when not in use.

23. Only clean, pure water shall be used, a sufficient supply of which shall be available at all times.

24. Dough-mixing machines must be cleaned daily and the inside thereof greased. All flour should be brushed off carefully. Bearings and grease cups should be wiped, stuffing boxes well packed so as to prevent leakage, and machine should be kept screened or covered when not in use in such a way as to permit circulation of air therein.

25. Metal dough-troughs must be well cleaned every time they are used and the inside thereof greased.

26. Wooden dough-troughs must be scraped clean every time they are used. *They must be washed with soap and water at least once a month* and aired frequently.

27. Trough covers must be scraped on both sides daily and washed with soap and water at least once a week.

28. Wooden dough-troughs must be made of sound lumber, well joined and smoothly finished. Troughs and covers must be free from holes, cracks and crevices.

29. Bread boxes and roll and bread boards shall be brushed every time they have been used and scrubbed with soap and water at least once a month.

30. All work tables must be cleaned daily and scrubbed at least once a week.

31. All dough-dividing machines, beating, mixing or depositing machines, brakes, rollers, cracker and cake machines, crumbing and grinding machines, must be cleaned daily when in use, and no dust, sugar, grease, dough or paste shall be permitted to accumulate in or about such machines.

32. Conveyers, driers and wires for icing machines must be kept clean, and can be operated only in a room that is free from dust.

33. Pie-making machines must be cleaned daily and all flour, fruit, filling and paste removed therefrom.

34. Cake-filling machines must be emptied and cleaned after each day's work.

35. All flour sieves and sifting machines shall be cleaned at least once a week. No moths or other insects shall be permitted to breed therein.

36. All flour bins, hoppers, chutes and conveyers shall be examined at least once a week and must be kept free from larvae, chrysalides and insects.

37. Iron pans must be cleaned each time they are used, and wiped with fat.

38. All racks and shelves must be cleaned once a month and scrubbed every six months.

39. Tin pans should be cleaned each time they are used and wiped with fat. Any adhering material, grease, flour or sugar that cannot be removed by wiping, must be washed off.

40. Cloths used for lining bread boxes, covering roll boards or cake pans, or for the purpose of covering dough or baked goods,

shall be used for no other purpose, and shall be washed at least once in two weeks.

41. Bake ovens must be well cleaned so no soot, ashes, or coal will adhere to baked goods.

42. Swab pails must be cleaned daily and fresh water must be used every time an oven is cleaned.

43. Steam or proofing boxes must be cleaned at least once a month and scrubbed at least once in six months.

44. The holding of bakery utensils in the mouth is prohibited.

45. All dishes, measures, strainers, dippers, cans, mugs, tubes, kettles, ornamenting and pastry bags, stamps, syringes, doughnut machines, bowls, spoons, scoops, mortar knives, scrapers, paddles, rolling pins, chopping, cutting, slicing or grating machines, egg whips and brushes, shall be washed with soap and water or some material equally efficient, and wiped dry with a clean cloth every day such utensils have been used.

46. All ice boxes and all places where food may be placed for cooling purposes, shall be kept clean and well ventilated.

47. All baskets, boxes and other containers that are used for carting, storing or delivering bakery goods, shall be cleaned daily and scrubbed once a month.

48. All wagons used for the delivery of baked goods shall be cleaned every day before loading and shall be scrubbed once a week.

49. All show cases, shelves, boxes and cans in which bakery goods are kept, must be washed at least once a week. Crackers, cakes and similar goods need not be removed out of original package or box for the purpose of cleaning such boxes or packages.

50. No tool or utensil used in bakery shall be used for any other purpose.

#### CARE OF RAW MATERIAL.

51. All flour, starch, meal, sugar, salt, corn or rice flakes, nuts, and nut meats, dried fruit and other material contained in bags,

must be stored on platforms or shelves at least eight inches from the floor and at least 2 inches from any side wall and be so stored that there is a free circulation of air on all sides.

52. All barrels or kegs containing oil, molasses, syrup or any other fluid food product, shall be tapped whenever feasible with a pump or faucet; whenever such tapping is not feasible, heads may be removed and good metal covers provided with rims extending downward over ends of barrels or kegs.

53. All barrels that contain lard, sugar, starch, cocoanut, mince meat, salt or other dry food product, shall, when the same are opened, be provided with metal covers that extend downward over top edge of barrels.

54. Metal covers shall be provided for all tubs, pails, drums, or other containers of jelly, jam or similar substances whenever they are opened and not entirely used at once.

55. All dried and desiccated fruits in boxes shall be kept well covered and protected against dust and vermin.

56. All prepared fruits, pie fillings and similar substances shall be kept in earthenware or wooden containers properly covered. Metal containers may only be used when the same are enameled or properly coated with block tin.

57. All spices, nutmeats, seeds, and other similar goods shall be kept in suitable containers of tin, pasteboard, or other material and well covered.

58. All prepared dough, other than dough containing yeast, shall be kept in earthenware or wooden containers properly covered. Such containers must be thoroughly washed every time they have been used.

59. All crumbs, struesel and other such goods must be covered in suitable containers so as to be protected against dust.

60. Chocolate, nut-paste, citron, lemon, and orange peel must be kept in suitable boxes or cans well covered and protected against dust.

61. Acids, alum, baking powder, drugs and chemicals, as also all compounds and preparations that are to be mixed and eaten with bakery products, shall be kept in suitable containers, covered and clean.

62. Dried egg and dried milk shall be stored in tight barrels, drums or cans, and not more shall be prepared in water than will be used within twenty-four hours.

63. Goods that are being dried for future use shall be kept clean and free from dust.

64. Fresh icings shall be prepared every day, and at no time shall icing be allowed to remain on sides or rims of vessels, but all vessels that contain icing must be kept clean and covered when not in actual use.

65. All flour used in bakeries shall be passed through a close-meshed sieve shortly before it is used.

#### CARE OF FINISHED PRODUCT.

66. All baked goods, whether in pans or other containers, must be kept at least twelve inches from the floor.

67. No person is allowed to handle bakery goods in any store or other place where such goods may be exposed for sale, unless such person has actually purchased such bakery goods or is in charge of the sale of such goods.

#### PERSONAL CLEANLINESS AND CONDUCT.

68. All persons working in bakeries, who handle or touch goods that are to be eaten, shall wash their hands and arms in clean water before beginning work and every time they have made use of water closet, urinal or privy, and every time they change from one kind of work to another, and every time their work is interrupted for any cause, before again touching or handling bakery products.

69. The outer garments to be worn by bakery workmen while at work shall consist of caps, shoes or slippers, and overalls or

aprons, to which bibs must be attached. In no case shall bakery products come in contact with shirts or other garments that lie next the bare skin of workmen.

70. External garments described in rule No. 69 must be washed at least once a week and under garments must also be kept clean.

71. The outer garments of female employees shall consist of shoes or slippers and large aprons with bibs; hair must be compactly and neatly done up in caps or nets. Aprons and bibs must be washed at least once a week.

72. All persons working in bakeries must keep their fingernails clean.

73. No person afflicted with any skin disease or with any communicable disease shall work in any bakery.

74. No person delivering bakery goods shall handle the same with dirty hands, or piled against his body or clothes, but all deliveries must be made in clean baskets, boxes, trays, or other containers.

75. No person shall spit or expectorate or deposit any sputum, mucus, tobacco juice, cigar or cigarette stumps or quids of tobacco on the floor, walls or furnishings of any bakery.

76. No person shall smoke or snuff tobacco while at work in any bakery.

#### WATER CLOSETS AND PRIVIES.

77. No pan, hopper or plunger water closet shall be put into any bakery hereafter established; and all such closets now in use must be replaced when worn out or filthy, with tank flushed syphon closets, properly trapped and ventilated.

78. All water closets and urinals in bakeries must be fully enclosed and provided with self closing doors. All closets and urinals shall be provided with a window to the outer air if possible; if such window cannot be constructed, closets and urinals must be connected with a ventilating flue providing a continuous current out of closet into the open air. Bowls and other fixtures

in sanitary conveniences must be scrubbed and cleaned at least once a week and care must be taken that no offensive odor emanates from such conveniences.

79. In places where it is not possible to have sanitary conveniences in bakeries on account of local conditions, privies with vaults may be maintained. Such privies must be located at least thirty feet from bakery and kept clean at all times. Such privies must be kept screened.

80. Privy vaults must be treated with lime or some equally good disinfectant once a week from April 15th to October 15th and once a month from October 15th to April 15th.

81. Sanitary conveniences must be provided conveniently accessible to all persons employed in bakeries.

#### DRESSING ROOMS AND TOILET FACILITIES.

82. Places where workmen change their clothing must be light and partitioned off by a wall or other substantial partition at least six feet high, and must be warmed during cold weather.

83. Rubbish must be removed from dressing rooms daily, and the rooms well cleaned at least once a week. They must be kept free from vermin at all times, and must be disinfected at once after becoming contaminated or infected.

84. Every bakery shall be equipped with running water, or in lieu thereof, sufficient wash basins, plenty of clean water and good soap shall be provided to enable persons working therein to keep clean.

85. Every person employed in mixing or preparing ingredients, and every person engaged in handling, moulding, scaling, shaping or baking bakery products shall be provided with at least one clean towel each day.

86. Where persons of both sexes are employed, separate dressing rooms shall be provided for each sex.

87. In bakeries where it is necessary to maintain separate sanitary conveniences for females, at least one such convenience shall be provided for every twenty-five females or fraction thereof.

88. If persons of both sexes to the number of eight or more are employed or in attendance at any bakery, separate sanitary conveniences shall be provided for each sex.

89. In bakeries where it is necessary to maintain separate sanitary conveniences for males, there shall be one such convenience for every twenty-five males; provided that in bakeries where the number of males employed or in attendance exceeds one hundred, and sufficient urinal accommodation is also provided, it shall be sufficient if there is one sanitary convenience for every twenty-five males up to the first hundred, and one for every forty after.

#### SCREENS.

90. Window and door openings in basement or on first floor must be screened with copper wire screens with meshes sufficiently fine to filter out any dust which may be carried by air entering bakery.

91. All other doors, windows or openings in bakeries must be screened from the 1st day of May to the 1st day of October in each year to prevent flies or other insects entering the bakery.

#### LIGHT.

92. Window space in bake or workrooms should not be less than one-fifth of the floor space of such rooms.

93. Prism lights must be provided whenever necessary in order to light every part of rooms.

94. No room can be used as bakeroom or workroom in which artificial light is needed all the time.

#### VENTILATION.

95. Rooms to be used as bakerooms or workrooms must be of sufficient size to allow each person employed therein at least 350 cubic feet of air space.

96. Each open fish-tail gas flame shall be considered to use air equal to six persons unless means are provided to carry off the waste products of such gas flames.



97. Each Bunsen burner shall be considered to consume as much air as two persons.

98. Provisions must be made to change air in bake and work rooms completely at least four times each hour.

99. At no time shall air in bakerooms or workrooms contain more than seven parts of carbon dioxide in ten thousand parts of air by volume.

100. Every bakery shall be provided with ventilating flues or in lieu of such flues, chimneys may be arranged so as to ventilate the bakery properly.

101. All outside windows shall be so arranged that they can be opened easily for the purpose of ventilation.

#### MISCELLANEOUS.

102. All drugs, compounds and preparations used for the purposes of exterminating rats, mice, roaches or other vermin, shall be kept covered, and in a place not used for the storing of any food products.

103. Cleanings from any machine or utensil, dustings from flour sacks, sweepings from the floor, or articles of food which have come in direct contact with the floor, shall not be used as food for public consumption.

104. All goods that have become spoiled or unfit for use must be removed from the bakery at once.

105. The use of live coal in steam boxes is prohibited.

106. Each workroom must be supplied with one or more cuspidors which must be cleaned daily.

107. No flour is to be received in any bakery unless it is in clean barrels or bags. All bags containing flour stored in bakery must be kept covered to prevent dust settling thereon and no empty flour sacks shall be used for the purpose of lining bread or roll boards, boxes, pans, or to place any dough upon, or to place baked goods thereon, or for a covering for bakery goods in process of preparation.

108. All standards, rules and regulations adopted by the Industrial Commission referring to the proper safeguarding of machinery, shall apply to all machines used in bakeries.

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## THE LAW ON BAKERIES IN ENGLAND.

### BAKEHOUSES.

BAKEHOUSES are defined as "places in which are baked bread, biscuits, or confectionery, from the baking of which a profit is derived." They rank as non-textile factories or as workshops, according as mechanical power is or is not used for the purpose of baking. Bakehouses, therefore, fall under the general law relating to factories and workshops, but they are not subject to certain special regulations which are set out in this chapter.

A place underground may not be used as a bakehouse unless it was so used before the end of 1901. Since the first of January, 1904, it has not been legal to use an underground place as a bakehouse unless it is certified by the District Council to be suitable as regards construction, light, ventilation, and in all other respects. If the District Council is not satisfied that the place is suitable in all these respects they may refuse a certificate. The occupier may, within 21 days of the refusal, appeal from the District Council to a Court of Summary Jurisdiction, and if the court is satisfied of the suitability of the place it may grant a certificate.

An underground bakehouse is a bakehouse in which the floor surface of any baking room is more than three feet below the surface of the footway of the adjoining street, or of the ground adjoining or nearest to the room.

Where a place has been let as a bakehouse for which the occupier cannot obtain a certificate of suitability unless structural alterations are made, he may apply to a court of Summary Jurisdiction for relief, which may be given in one of two ways. The court may either make an order requiring the owner\* to bear the whole or part of the expenses of the alterations, or it may, at the occupier's request, determine the lease.

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\*An owner within the meaning of sec. 4 of the Public Health Act, 1875.

A person may not occupy any room or place as a bakehouse, and may not let it or suffer it to be occupied as a bakehouse, unless the following regulations are complied with:

- (1) No water closet, earth closet, privy, or ash pit may be within the bakehouse or communicate directly with it.
- (2) Any cistern for supplying water to the bakehouse must be separate and distinct from any cistern for supplying a water closet.
- (3) No drain or pipe for carrying off faecal or sewage matter may have an opening within the bakehouse.

In underground bakehouses 500 cubic feet of space must be allowed to every person; in other bakehouses where work is carried on at night by artificial light other than electric light, 400 cubic feet of space must be allowed to every person in respect of the period between 9 P. M. and 6 A. M.\*

In every bakehouse the inside walls and ceiling or top of every room, and the passages and staircases, must either be painted with oil, varnished or limewashed, or be partly painted or varnished and partly limewashed. Where there is paint or varnish, there must be three coats, renewed every seven years, and washed with hot water and soap every six months. Limewashing must be renewed every six months.

A place in the same building with a bakehouse, and on the same floor, must not be as a sleeping place, unless:

- (1) it is effectually separated from the bakehouse by a partition from floor to ceiling; and
- (2) there is in the sleeping place an external window of not less than nine superficial feet in extent, of which four and a half superficial feet are made to open.

There is also a general provision that, where a Court of Summary Jurisdiction is satisfied that a place used as a bakehouse is unfit on sanitary grounds to be so used, the court, in addition to

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\*These requirements are embodied in an order of the Secretary of State, dated December 30, 1903 (gazetted January 1, 1904: F. and W. O., 1908, p. 9).

or instead of imposing a fine on the occupier, may order him to remove the ground of complaint within a given time, under penalty of a fine not exceeding 1 pound (\$5) per day during non-compliance.

All bakehouses which are factories (i. e., those in which mechanical power is used in aid of the process of baking) are in all respects subject to the control of factory inspectors in the same manner as other factories. But as far as concerns a "retail bakehouse" (that is a bakehouse or place, not being a factory, the bread, biscuits, or confectionery baked in which are not sold wholesale but by retail in some shop or place occupied together with such bakehouse), the special sanitary provisions mentioned in this chapter are administered by the District Council and their officers, and not by the factory inspector, but the regulations as to education, hours of work, and meal times are administered by the factory inspector.

The provisions of the principal Act which apply to men's workshops, and the special sanitary provisions for bakehouses, apply to a bakehouse which is a workshop in which no child, young person or woman is employed.

Three of the special exceptions, by virtue of which exceptional employment is allowed in factories and workshops, apply to bakehouses. These exceptions relate to:

- (1) special employment of male young persons over 16;
- (2) overtime of women in biscuit making; and
- (3) overtime of children, young persons, and women for half an hour at the end of the day. (Incomplete process.)

The provisions of the principal Act which require (1) that the meals of all children, young persons, and women shall be simultaneous, and (2) that no child, young person, or woman shall, during meal times, be employed, or allowed to remain, in a room in which work is being done, do not apply to bakehouses which are factories, and in which bread and biscuits are made by means of traveling ovens.

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**APPENDIX IV**

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**WOMEN WORKERS IN FACTORIES  
IN NEW YORK STATE**

NOTES ON SOME TRADES IN NEW YORK STATE EMPLOYING A  
LARGE PROPORTION OF WOMEN WORKERS

BY VIOLET PIKE

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## **WOMEN WORKERS IN FACTORIES IN NEW YORK STATE**

- I Extent and Importance of Women's Work in Factories in New York State.
- II Sources of Information.
- III Extent of Investigation.
- IV Notes on Some Trades in Which Women are Employed.
  - 1. Artificial Flower and Feather Industry in New York.
  - 2. Women's Waist Trade in New York.
  - 3. Steam Laundries in New York.
  - 4. Paper Box Factories.
  - 5. Textile Mills at Utica.
  - 6. Men's Clothing Trade in Rochester.
- V. Character of the Work Done by Women in Factories.
- VI Hours of Labor of Women in Factories.

### **I. IMPORTANCE OF WOMEN'S WORK IN FACTORIES IN NEW YORK STATE.**

Trades in which large numbers of women are employed are sometimes called women's trades. This is only true in a comparative sense. Women workers in New York State are found in all the trades in varying proportions. Even electrical works, iron foundries and automobile shops have their quota of women workers. The only industries in this State (except for some very

minor industries employing less than one thousand workers) which do not employ women, are the manufacture of bricks, tiles, fertilizers and ice. According to the preliminary report of the United States census, 1910, 293,637 women are at work in factories in New York State, 30 per cent of the total number of wage-earners employed.

The following table shows the number and proportion of women workers in the industries investigated by the Commission, and the numbers and proportion of women in the same industries in the State.

TABLE No. 1.

NUMBERS AND PROPORTION OF WOMEN WAGE EARNERS IN MANUFACTURING ESTABLISHMENTS IN SELECTED INDUSTRIES, COMPARED WITH NUMBERS AND PROPORTION OF WOMEN WORKERS IN THE STATE AT LARGE.

	WAGE EARNERS IN ESTABLISHMENTS INVESTIGATED			WAGE EARNERS IN ESTABLISHMENTS IN NEW YORK STATE		
	All workers	Women	Per cent Women	All workers	Women	Per cent Women
Artificial flowers and feathers..	1,891	1,493	79	8,301	7,152	86
Clothing (waists).....	11,896	9,186	77	97,656	56,185	57
Paper boxes.....	3,491	2,596	74	11,203	7,253	65
Laundries.....	5,523	4,148	75	*	.....	.....
Pickles.....	557	406	72	7,003	3,901	56
Textiles.....	1,513	976	64	9,268	4,010	43
Candy.....	2,911	1,722	60	8,399	4,967	59
Corks.....	611	364	60	890	394	45
Dyeing and cleaning.....	929	514	55	5,224	1,551	29
Spices and drugs.....	341	188	55	1,517	465	31
Rags.....	331	178	53	*	.....	.....
Human hair.....	547	256	47	2,303	1,305	56
Tobacco.....	2,677	919	34	29,757	15,191	54
Chemicals.....	1,739	536	31	5,733	166	3
Printing.....	6,657	872	13	62,505	13,997	22
Meat packing.....	987	87	9	6,104	168	2
Bread.....	3,021	1	.....	21,250	2,837	13
Ice cream.....	50	.....	.....	*	.....	.....
Mineral waters.....	443	.....	.....	*	.....	.....
Other trades.....	11,957	989	9	776,868	173,983	22
Total.....	58,072	25,431	44	1,003,981	293,525	30

\*Not listed in preliminary report U. S. Census, 1910.

The importance of the women workers' part in manufacture is evident from this table. They have become a permanent factor in the industrial life of the State. Yet the individual workers are constantly shifting and changing. It has been said that seven years is the average length of time a woman remains at factory work, for the mass of women workers after a term of years leave the factory to become wives and mothers. The concern of the State in its women workers is therefore two-fold. It



is interested in their welfare as workers, but it is far more deeply concerned that they do not, while adding to its economic wealth, work under such conditions as to impair their health and vitality as mothers of the next generation.

## II. SOURCES OF INFORMATION.

Owing to limitation of time and resources, no investigation was made into special conditions affecting women workers, although six of the twenty industries considered by the Commission employed large numbers of women. This report, therefore, deals chiefly with results obtained through the general sanitary investigation, which was limited for the most part to observation of actual conditions prevailing in the work-places. In general (these conditions do not differ materially in shops employing men or women, or both), establishments in standardized industries, conducted in districts where rents are normal, are not so apt to offend in regard to general sanitary conditions as are establishments in unstandardized trades, in localities where there is much speculation in land values. Dirt, dust and disorder, overcrowding, bad lighting and ventilation are no respecters of sex. They are found in all industries, in shops employing both men and women. Their prevention is not so much a matter for legislation, as for rigid enforcement of simple and well-defined sanitary standards. Information in regard to these factors which most affect the health of women workers, namely, duration, intensity and character of employment, sweating, seasonal work and wages, was gained only incidentally. Except for the question of duration this report does not attempt to deal with them.

The following table gives the number of inspections made, establishments inspected and numbers and proportion of women workers in the six trades employing the largest number of women workers, and their ratio to the total number of women workers in these industries.

TABLE No. 2.

ESTABLISHMENTS AND WORKERS IN SELECTED INDUSTRIES EMPLOYING OVER SIXTY PER CENT OF WOMEN WORKERS.

INDUSTRY	No. Estab-lish-ments	No. inspec-tions	WORKERS			Per cent of workers in State covered by investigation
			Men	Women	Minors	
Artificial flowers and feathers.....	94	120	341	1,493	57	19
Clothing (waists).....	200	228	2,016	9,425	141	10
Laundries.....	110	244	1,339	4,148	36	*43
Paper boxes.....	53	135	832	2,595	203	20
Textiles.....	7	28	492	976	32	15
Total.....	518	911	6,004	20,359	534	16

\*Percentage based on figures given by State Dept. Labor.

### III. EXTENT OF THE INVESTIGATION.

The 94 artificial flower and feather firms, and the 200 establishments in the women's waist trade were located in New York city. Inspections of the textile mills were made at Utica, and the report on the men's clothing trade was the result of a brief investigation at Rochester. Laundries were visited in New York, Buffalo and Troy; paper-box factories in New York and Buffalo. The reports on laundries and the knitting mills at Utica and the men's clothing trade in Rochester were prepared by Miss Louise Carey.

### IV. NOTES ON SOME TRADES IN WHICH WOMEN ARE EMPLOYED.

#### 1. ARTIFICIAL FLOWERS AND FEATHERS.

New York city is the great center of this trade. Three-fourths of the artificial flowers manufactured in the United States are made in New York city, and particularly on Manhattan Island. This, too, is a trade that employs a very large proportion of women. In the shops investigated by the Commission, 1,493, or 79 per cent of the workers employed, were women. The proportion of women workers in the trade in New York State is as much as 86 per cent.

#### *Processes in the Trade:*

Flower and feather making, though quite different processes, are frequently carried on in the same factory and by the same

workers. This is due to the shortness of the flower season. When the flower season is over, the workers begin making up feathers for the winter trade. A number of establishments make only feathers, as the demand for these is steadier. Of the 94 establishments investigated, 22 made only flowers, 47 only feathers, and 25 both flowers and feathers.

The processes in flower and feather-making are nearly all carried on by hand, with the aid of simple tools. A few men are usually employed in each shop for dyeing the materials and cutting and stamping the leaves and petals, but all the rest of the work that goes to make the finished flower is done by the women. They crimp the petals with heated irons, wrap the stems and "slip up" the petals of the cheaper flowers. In the better grades of roses, each petal has its place and is attached separately, the operation requiring not a little skill. After the flowers are made they are "branched" and arranged in wreaths and in combinations with foliage.

In making artificial flowers a possible danger in the trade comes from the use of aniline dyes. The workers complain of irritation to the skin and to the membranes of the nose and throat. The colors rub off on the hands and are apt to be transferred to the face and mouth of the worker in the course of the day's work.

In the artificial feather trade there is some danger to the workers from the constant inhaling of tiny bits of feather fluff that are detached during the processes. Sore throat, asthma, bronchitis and diseases of the eyes often occur among feather workers. For this reason it is considered a rather unwholesome trade.

### *Condition of Work Places:*

Of the 94 establishments inspected, 45 per cent were situated in tenements, converted tenements, or dwellings. This is very characteristic of the trade, as it needs no machinery; the tools are simple, the materials cheap and not bulky. Tenements and private houses were never intended for manufacture; their light and ventilation are bound to be deficient. Seventeen per cent of the establishments inspected used artificial light in the daytime. A basement shop on Broadway employing 30 workers had no windows at all and only one small electric fan.

About one-quarter of the shops inspected were really clean; while almost half were in a really filthy condition, a larger proportion than that found in any other of the six trades. No lunch rooms for the workers were found in any of the establishments, and only in eight were the washing arrangements ample.

### *Home Work:*

The artificial flower and feather trade is one of the largest home-work trades in the city. The trade is concentrated in districts near the congested tenement sections, such as lower Broadway from Spring to Eighth streets. In a detailed and careful study of the artificial flower trade made by the Committee on Women's Work of the Russell Sage Foundation, in the spring of 1910, out of 114 firms investigated, 76 firms gave out home work to between 2,227 and 2,385 families. Two was the smallest number of workers found in any one family. The evils of tenement work have been fully explained and described year after year, so that it is hard to believe that anyone can still be ignorant of its danger to the purchasing public and to the workers themselves.

Considered by its effect on the trade, home work is even more disastrous. These thousands of workers outside the factory are not only a temptation to progressive exploitation themselves, but unconsciously assist in reducing the wages of the workers inside the factory, and in shortening the already too short season. These effects are clearly shown in the study mentioned above.

By home-work or tenement-work is meant any kind of manufacturing done for a manufacturer, contractor or agent by persons not working on the premises or under the supervision of such a manufacturer, contractor or agent, the wages and rates of payment for these workers being fixed by the persons giving out the work. In its essence home-work, as thus defined, is unlawful, or at least beyond control by law. In New York State we have a Labor Code, certain sections of which exist for the express purpose of regulating conditions under which manufacturing may be carried on in the State, but by giving out home-work a manufacturer is literally able to break every law on the statute books. His

work may be done in unclean, unsanitary surroundings, it may be performed by little children or minors working long hours after 5 p. m., when the law frees the girl and boy workers in the factories, or by young girls working far into the night. Home-work means unregulated manufacturing, carried on beyond the possibility of control as to hours of women's work, child labor, night-work of minors, or cleanliness and sanitation of work-places. In its efforts to inspect the 13,000 licensed tenements in New York city, the Department of Labor is attempting the impossible. From the point of view of the community, the greatest objection to home-work is its lawlessness.

## 2. CLOTHING (WOMEN'S WAISTS).

### *Location of Buildings:*

New York city is the greatest center of the women's waist trade in the United States. The 228 shops inspected were on Manhattan Island, south of 35th street, in the most congested portion of the city. Ninety-one per cent of the establishments inspected were located in loft buildings, and of the 11,000 odd workers in these shops, one-half were employed above the sixth floor. This overwhelming proportion of loft shops is characteristic of all branches of the clothing trade in New York city. The Asch fire disaster of last March threw a lurid light on the fearful risks to the workers involved in such a situation.

### *Condition of Work Places:*

It is remarkable that a very large percentage (62 per cent) of the waist shops inspected used artificial light in the daytime, while 60 per cent had no protection from glare — this, too, in a trade where proper lighting would seem to be a prime necessity for efficient, accurate work, to say nothing of the effect of such inadequate illumination on the eyes and health of the workers.

A larger percentage (28 per cent) of extremely dirty shops were found than in any other trade employing over 50 per cent of women workers, with the exception of the artificial flower and feather industry. Thirty per cent of the water closets were in a filthy condition and had no light or ventilation whatever.

*Processes of Manufacture:*

The waist trade has had many vicissitudes of late years, owing to changes in the market, and many shops that formerly made only waists now make waists and dresses, either together or as supplementary trades. The processes do not differ greatly from the other branches of the clothing trade. Men are always employed to do the cutting of the materials, and a small proportion of men operators is found in some of the shops, particularly those making the cheaper grades of waists and dresses. Women are employed at the different branches of operating; such as lace running, tucking, and machine button-holing, and also as finishers and hand button-hole makers. In making the cheaper grades of waists, the subdivision of processes is carried very far, and a waist may pass through the hands of a dozen workers before it is finished. This "section work" is nearly always piece-work and requires very little skill, speed being the prime necessity. The better grade of waists and dresses, however, cannot be made in this way, and one girl will make the whole garment, or a large part of it. Such workers are usually paid by the week, since greater skill and carefulness are required.

*Dangerous and Unhealthy Elements in the Trade:*

In common with the other branches of the clothing trade, the dangers to the women workers are not inherent in the industry itself, but are due to the conditions under which manufacture is conducted. The hazards of death or injury from fire that must be daily assumed by the women worker in loft factories on Manhattan Island are terrific. But the overcrowding of work rooms, long periods of overtime, with irregular daily schedules, running from ten to fourteen hours, with consequent over-fatigue and exhaustion, the speeding up of both workers and machines, which keeps nerves and muscles in continued tension, are factors that from day to day seriously impair the health and vitality of the women workers. No amount of cleanliness and convenience in the work rooms can offset the injurious effects resulting from long, irregular working hours and nervous strain.

## 3. STEAM LAUNDRIES IN NEW YORK CITY.\*

*Character of the Work:*

The character of work done in New York laundries varies with the type of laundry. There are, roughly speaking, seven types: hand, custom, manufacturers', wholesale, flat work, hotel and wet-wash laundries. Hand laundries do hand ironing only; custom laundries do general family work, dealing directly with the customer; manufacturers' laundries, which are generally run in conjunction with a factory, do up new work only, the process depending on the character of the goods.

Wholesale laundries are institutions peculiar to New York city. These laundries receive their work from the four or five thousand so-called hand laundries in large nets about a yard square and return it to them rough dried, with the exception of collars and cuffs, which are ironed by machine. In some cases they do flat work, sheets, towels, napkins and pillow-cases; but more often flat work is sent to factories that make a specialty of mangling and are patronized by hand-laundries, hotels, restaurants, steamships and railroad companies. Hotel laundries as a general rule do flat work only, but some of them have a custom laundry department run in conjunction with the hotel. Wet wash laundries constitute still another class. These do washing for families at fifty cents a basket, returning the clothes rough dried to their customers.

*Description of Process:*

The several processes in the laundry trade are washing, extracting, starching, drying and ironing. The principal operations are listing, marking, assorting, washing by hand and by machine, tending extractors, shaking, feeding and folding, starching by hand and by machine, collar finishing, mending and tying up. The same girls are generally employed as checkers, markers and assorters. The checkers or listers and the markers have the unpleasant and dangerous task of examining and marking the soiled clothes as they come in, and while their work is mainly

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\*This report is based on an examination of 110 laundries in the State, 84 of which were in New York city.

clerical, both they and the assorters, who go over the clean clothes, are obliged to stand all day.

The operating of washing machines is in New York almost invariably done by men. These machines are large, cylindrical receptacles, approximately  $5 \times 2\frac{1}{2}$  feet in size, in which, by a reversing motion, the dirty clothes are shaken up with hot water, soap and chemicals. In the same room with the washing machines are the extractors. The dripping clothes are packed into a perforated metal basket, which is enclosed in a heavy iron shell connecting with a drain; the basket is then whirled round at an extraordinary speed, and the water is forced out at the perforations by centrifugal force. The proper guard for an extractor is a metal covering, but laundrymen find that heavy canvas is more efficient protection for the clothes. The objection to the canvas covering is that in case of a light load it is impossible to adjust, and the machine is allowed to run unguarded.

The mangle room is generally situated above the wash room, but is also frequently a part of it. The shakers, generally young girls, take the twisted clothes as they come out of the extractors and slap or shake them violently, an operation which must be performed standing, and is fatiguing in the extreme. The feeders or manglers also have to stand at their work. They take the sheets, pillow-cases, napkins, etc., from the shakers, and so place them on the apron of the mangle that they are carried under and over revolving padded rolls which receive their heat from a large steam-heated cylinder. The folders on the other side receive the freshly ironed work, fold it and place it aside. When the articles are small, the latter are sometimes allowed to sit at their work.

After the process of mangling, flat work is finished, and as soon as it has passed through the hand of the assorters, is ready for delivering. All other work as it comes from the shakers goes through a starching process, the starching room being generally situated above the mangle room. Collar and cuff starching machines, built somewhat like small mangles, are in use in most of the laundries in New York, but the greater part of the starching is still done by hand. It is one of the duties of the starchers to attend to the drying of the clothes. Making part of the starch room, or con-



necting with it, is the dry room, a wooden chamber in which the air is heated up to 300 degrees F. The clothes are generally hung on sliding racks, but a system of endless chains is coming into use. The collar and shirt dampening machines are also found in the dry rooms. These machines are built like mangles and are partially enclosed by wooden shields. The operators feed between the rolls.

The ironing department is generally found on the top floor. The process of hand ironing is the same in the steam laundry as in the home, except that the work is done at a much greater speed, and the irons are gas-heated. Owing to the great amount of strength required, a large percentage of the hand ironers are men. On the other hand, women are employed almost exclusively to operate the ironing machines, of which there are many types. Collars and cuffs are ironed by means of what is known as the collar ironing machine, but, properly speaking, it should be called a collar mangle. The collars and cuffs are fed over a wooden board between a series of gas or steam-heated rolls, and received on the other side. Both operators and receivers may sometimes be seated, though more usually they stand.

Another type is the body ironer, which consists of two large rolls, the lower generally padded and the upper heated by a row of gas jets. The article is slipped over the lower roll and the operator, by foot pressure, releases a spring, which lifts this into contact with the heated surface. The pressure must be continuous and steady, and in most cases a reversing motion requires double treadle action. Machines of this type vary greatly. Some require almost the whole weight of the operator, others only a slight pressure, but the lower part of the operator's body is in a constant state of contortion. Shirt, bosom, cuff, collar and neck band presses are also operated by means of treadles, but with this difference — the motion of only one foot is required and that motion is not continuous but spasmodic. As in the case of the body ironers, the more recent makes of machine demand far less actual physical effort.

Five or six types of collar-finishing machines are in use — seam dampeners, collar tipping machines, collar shapers, etc. The operation in each case involves merely the feeding of the machine,

except for the wing point tipper, which requires a very violent double treadle action. The girls at the collar-finishing machines usually sit at their work, with the exception of the operators on the wing-point tipper.

*Workers:*

There seem to be more German women than of any other nationality in the laundry trade; Italians come next, then Poles, and, lastly, Americans. A number of Jewish men are employed as shirt ironers, but very few Jewish women. There are not many very young girls. The majority of women look over thirty, many of them over fifty; and the men look, for the most part, over thirty-five. About 80 per cent of the workers are women, men being employed only as washers and shirt ironers. Women are employed in all departments with the exception of the wash room. The great fatigue of both men and women laundry work is very evident.

*Condition of the Work Places:*

Most of the New York laundries were found to be dirty, only three of them being in really good condition in regard to cleanliness of walls, floors and ceilings. The floors of the starch rooms are particularly neglected. The washing facilities consist in almost every case of a sink, generally dirty, and a cold water spigot. The toilet rooms are rarely clean, and there is generally no ventilation except from the shop. Special lunch rooms are not provided, and employees eat their lunch in the shop.

Artificial light is needed and used in the majority of the laundries. Welsbach burners are most frequently found.

The problem of ventilation is partially met by fans and exhaust pipes; but the air of almost every steam laundry is oppressive. One reason for poor ventilation in the winter is that the laundries have, as a rule, no special system of heating, and so turn off the exhaust fans and shut all windows as soon as the cold weather sets in.

*Dangerous Elements in the Trade:*

There are dangerous elements connected with every operation in laundry work. They may be classed as dangers from over-

heating, from steam, from gas, from water, from unguarded machinery and from undue physical strain.

It is a significant fact that so much heat is generated by the processes of the trade that it is rare to find in a steam laundry any other system of heating. The air is most oppressive in the starching department, owing to the proximity of the drying room, but the ironing room and the wash room are almost equally uncomfortable. Laundresses frequently complain of the floors being hot, and it is quite usual to see them standing with their swollen feet tied up in rags. It is a well known fact that excessive heat has a debilitating effect on the whole system.

Steam is visibly present in every department of the laundry except in the ironing room, which thereby escapes having an exhaust fan. The washing machines and mangles generate the greater part of the steam, but the starching machines and the dry rooms are responsible to some extent for the humidity of the air. Laundresses complain of pains in the chest as the result of inhaling steam, and they are particularly liable to colds, coughs and bronchitis. The mortality from consumption among laundry workers, noted by Sir Thomas Oliver and Professor Landouzy, is said to be due to the inhalation of steam.

Mention has been made of the use of gas in laundry work. It is generally admitted that the use of gas vitiates the atmosphere and so affects the workers. In the case of laundry machinery, the leakage is so noticeable that workers frequently suffer from carbon monoxide poison. Laundresses complain of headaches, sore eyes, nausea and dizziness, caused by escaping gas, as well as of a general run-down condition.

The problem of water on the floor relates only to the washing room. Many of the washers suffer from rheumatism from this cause.

With regard to dangerous machinery, mention has been made of devices for covering extractors. It has frequently happened that men have had their arms torn off for lack of proper guards. In this connection, the case of Beckstein *vs.* the Central Star Laundry Company (140 App. Division 8), is interesting. Plaintiff had his arm torn off and could not recover on the ground that it was not customary to provide covers for such machines, and that,

when provided, their purpose was the protection of the clothes from dirt rather than of the men from injury. Another case brought by the Bureau of Factory Inspection against a laundry for not providing covers for extractors, was dismissed on the ground that extractors are not dangerous machines. It is also usual to find unguarded or insufficiently guarded belting and pulleys in steam laundries. This constitutes considerable danger to women, on account of the possibility of their skirts and hair catching in these pulleys. Cases are known of girls being scalped in this way.

There has been so much discussion of the dangers of mangle work that it is impossible now to find a totally unguarded mangle, but while improvements are constantly being made in the machines, no guard in use seems to cover the case. The older types of guard are stationary rolls and upright bars, the former being more generally used in New York city. It has, however, been the experience of many laundry workers that the small roll acts as a warning rather than as a guard. If it is placed near the large roll there is danger of the hand being drawn in, and if at some distance, a space is left unguarded. With regard to the upright bar, there is a chance of the hand being injured and burnt, though it is improbable that it could be absolutely crushed. The rolls and upright guards on the latest makes are so constructed that they move forward and the machinery stops as soon as there is any pressure on them, but in case of the roll, it would still be possible for the operator to get a hand on the further side, and an employer told the investigator that he had found girls trying to straighten material between a movable upright guard and the large roll. While the operation of feeding the mangle is obviously more dangerous than that of folding, the feeder has been comparatively so well protected that it is now the folder who is in great danger. It is, of course, unlikely that a girl would reach forward and so get her hands between the rolls at the back of the mangle, but such cases do occur, and in a very recent one, a girl lost both her hands.

Starching machines, roll-ironing machines, steam presses and shirt and collar dampeners are all open to the same objection, that the hand is likely to be caught and crushed, although there is not

the danger of very serious accidents, such as occur in mangling. With the exception of the shirt and collar dampeners, all the machines mentioned have unprotected hot surfaces, and daily injuries from burns occur in all steam laundries.

It has already been noted that the majority of the operations are performed standing, and the specific effects from long standing upon women are well known. Women who stand all day are subject to numerous pelvic disorders, and this is particularly the case among workers in the laundry trade. The women also suffer from varicose veins, swollen feet and flat foot and a large proportion wear rubber stockings and bind their feet with plaster. Diseases resulting from undue physical exertion appear to be confined to hand starchers, hand ironers and operators of treadle machines. The effects on the workers of starching and ironing are much the same, although ironing is the more difficult operation — pains in the back and side and paraesthesia of the finger tips. Hand ironers in addition suffer from synovitis of the extensor muscles of the forearm, and diseases of the stomach. Body ironers suffer from displacement of the left kidney, in addition to the pelvic disorders to which workers on all treadle machines are subject. This information is corroborated by evidence in the United States Government Report on Condition of Woman and Child Wage Earners in the United States. (Volume XII.)

*What is Being Done in the Best Establishments to Remedy the Evils:*

Hoods over mangles connecting with exhaust pipes are occasionally found, but there are no provisions for the removal of steam, other than fans in the windows.

An effort is made in most establishments so to mix the gas with air that no leakage will be possible, but employers and employees agree that perfect combustion cannot be attained in the case of roll-ironing machines. In one laundry the body ironer was provided with a hood and vent pipe, a device required by the English law, which seemed very effective. The newer makes of collar-ironing machines are heated by steam. Gas heated machines should be prohibited unless provided with hoods and vents. Irons should be heated by electricity. All machinery should be guarded, as indicated in the paragraph on

dangerous elements in the trade. Hours of labor should be limited to eight. No women should be allowed to stand more than six hours. Seats should be adjusted to machines wherever possible.

#### 4. PAPER BOX TRADE.

New York and Buffalo are the two centers for the paper box trade in the State. The largest establishments investigated were in Buffalo, where one firm has three different factories, employing over 2,000 workers. Most of the boxes of well-known brands of cigarettes, such as the Schinasi, Mogul, Pall Mall, etc., are made in these factories.

##### *Condition of Work Places:*

Seventeen per cent of the establishments inspected were located in special factories. A few of the up-State factories were model establishments, with efficient ventilating systems, ample washing and dressing rooms, and special lunch and rest rooms. Nineteen per cent of the shops, a comparatively large proportion, were extremely clean, and only nine per cent very dirty.

##### *Processes of Manufacture:*

The principle operations in the trade are cutting (grinding or scoring), folding, pasting, corner-cutting and corner staying, "filling in" and "collaring." Not all these operations are necessary for making every kind of box — in making cartons, for example, cutting, scoring and folding are the only needful operations, and in making pill-boxes, the paper, cardboard and glue go into an automatic machine which turns out boxes and covers complete.

While there is a good deal of hand work in the trade, and while the finest grades of fancy candy and flower boxes are made by hand, machine work is increasing. There are a great many different types of machines in use now; die-presses for printing cartons, cutting, scoring and grinding machines; the Knowlton-Beach corner-stayers and corner-cutters; "collaring machines" for lining cigarette boxes, automatic machines and many other types — some of foreign and some of domestic manufacture. Men

are employed sometimes to do the corner-staying and cutting, but women and girls frequently operate these, as well as the collaring and automatic machines.

*Dangerous Elements in the Trade:*

A real danger to the workers comes from the use of these machines. The Knowlton-Beach corner-stayer is responsible for many crushed and broken fingers, and no really safe guard seems yet to have been devised. The workers complain that the present type of guard is apt to catch the fingers when working quickly. Some firms provide iron thimbles, but these are clumsy and do not always prevent accidents.

The corner-cutting, filling-in and collaring machines also have their quota of accidents. In one shop employing about 800 workers, the inspector counted seven girls with bandaged hands; one girl had lost three weeks' work through crushed fingers caught in a corner-staying machine. In another smaller shop the foreman showed his own hand, with the two joints of his two first fingers missing, saying, "You aren't a boxmaker until you get that trade mark."

The collaring machines are similar in operation to the familiar punch-press, but are not so heavy, and consequently the accidents are not so serious. They are set in motion by a lever controlled by the foot, and as the work is paid by the piece, the operators, usually the youngest girls, often attain a high rate of speed. Every now and then the machine sticks, the worker quickly slips in her hand, forgets that her foot is on the lever and down comes the press. One Buffalo manufacturer said that he had had so many accidents that he had installed clutches on a level with the press instead of the foot lever, so that the workers' hands were perforce occupied while the press was in motion. He said that the output per day was not quite so great, but that the clutch completely did away with the possibility of accident. The die-presses used in some large factories are also dangerous. The girl operators stand at their work, removing and inserting the cartons every two seconds as the presses automatically open and shut. An instant's hesitation may result in a serious accident. No guards were found on any of the presses inspected. In one shop girls

were at work feeding glued cartons between high-speed rollers; three of these machines were "guarded" with bars so high above the rollers that they were practically useless. The fourth machine had not even this "guard;" the superintendent said he intended to provide one, but had been too busy since the firm had moved. This moving proved to have taken place several months previous, during which time the machine had been running completely unguarded.

In very few shops was the belting sufficiently guarded. In a trade employing such a large number of women and young girls this ought to be mandatory. A factory may be "lucky," but the possibility of an apron string, the edge of a skirt or a hair ribbon catching in the pulleys is always present. It is significant that in the two factories where the guarding was most thorough, there had been bad accidents. But why wait for the accident?

#### 5. TEXTILE MILLS IN UTICA.

Utica is the knit goods center of the United States. According to a statement issued by the Utica Chamber of Commerce, twenty-one mills, employing a total of six thousand people, do a business of over \$20,000,000 a year. Underwear, sweaters, caps, hosiery and infants' furnishings are produced. Seven establishments were visited, employing nearly 1,500 workers altogether.

##### *Description of Process:*

The several processes are winding, knitting, napping, washing and dyeing, cutting and making-up. Both men and women are employed in the process of winding. The winder stands all day watching from sixteen to twenty-five bobbins, ready to tie up a broken thread, and on the lookout for any hitch in the mechanism. Men are more generally employed as knitters, although women seem able to do the work as well. The duty of a knitter is to watch an allotted number of cylinders, as the knitting machines are called, and like the winder, be continually on the lookout for broken threads. In one factory the cylinders extend from the first to the third floor, while in another the cylinders, about four feet in height, are placed on long tables. Each knitter tends six cyl-



inders, and connected with each cylinder are six bobbins which makes a total of thirty-six threads to be accounted for. In this factory seats are provided for the knitters, but it is rarely possible for them to sit down. The operation of napping is invariably performed by men. The material is put through a machine built somewhat like a laundry mangle which has the effect of raising the nap on the right side. It is usual to send the goods out to be washed and dyed, but one of the factories visited has a special department for washing and dyeing. The operation of cutting, for which men are employed, is performed by means of a cutting machine similar to that used in the garment trades. For making-up, women are almost invariably employed, the processes being practically the same as in the garment trades except that less skill is required and the machines are consequently geared up to make from thirty to forty thousand stitches a minute. A foreman told the investigator that the average is thirty-five thousand stitches a minute. Women are also employed as folders and inspectors, and at this work they stand all day.

#### *Dangerous Elements in the Trade:*

The specific danger in knitting mills is the presence of cotton and woolen dust in the air, which is particularly objectionable in the napping room. Knitting is classed among the dusty trades, and consumption is common among employees of knitting mills. (Bulletin No. 79, United States Bureau of Labor.) The fact that the women and child operators, all on piece-work, are compelled to work eight and ten hours a day, according to age, on machines geared up to make as many as forty thousand stitches a minute would seem to constitute an even greater danger. Moreover, the continuous standing necessary for women winders, knitters, inspectors and folders is in the highest degree destructive of health.

#### *Workers:*

The majority of the workers in the knitting mills are American-born. There are, however, a number of Poles, Italians and Syrians. The sex of workers employed in the various depart-

ments has been noted in the previous paragraph. About seventy-five per cent of the workers are women and young girls, and the extreme youth of a number of the operators is very evident.

#### *Conditions of the Work-Places:*

The establishments visited were light, clean and well-ventilated. Other factories presented the same modern appearance, and were obviously so built as to make for good natural light and ventilation.

As usual a sink and a cold-water spigot constitute the washing facilities. The toilets are far above the average in cleanliness, and nearly all of them have windows to the outer air. The employees generally eat their lunch in the shop, and no special lunch rooms are provided.

Electricity is used in all establishments. In two finishing rooms mercury light is used in addition to electricity. In the latter case there seems to be no necessity for protection from glare, but the operators in two factories work by unshaded electric lights. The proportion of workers wearing glasses is very large.

As already stated, the natural ventilation is good, though only one work-room was provided with an exhaust fan or any form of forced ventilation.

#### *Hours and Wages:*

The hours throughout the trade are from seven to six, making a total of sixty hours a week. When the factories close at five on Saturday, they make up the lost hour by taking ten minutes from the lunch hour. As to the extent of overtime, in one factory, the foreman said that the workers sometimes stayed until eight o'clock. As work is paid almost entirely by the piece, it is fair to assume that the full fifty minutes for lunch is not taken.

#### *What is Being Done in the Best Establishments to Remedy the Evils:*

In one of the establishments inspected suction pipes are placed underneath the napping machines. In another exhaust fans are

provided in the main knitting room, and humidifiers in the knitting and winding room. With regard to the other evils, nothing is being done to remedy them.

If the factories inspected are typical, the workers do not suffer greatly on the whole from bad sanitary conditions. They do suffer from the difficult and exacting character of the work, from speeding up, from the length of the working week, and from the lowness of the wages paid.

#### 6. MEN'S CLOTHING TRADE IN ROCHESTER.

##### *General Character of Trade:*

Rochester is one of the four great centers for men's ready-made clothing, approximately 3,504 men and 2,528 women being employed in the industry, according to the census of 1905. The goods manufactured are all of a high grade, *i. e.*, no suits are made which sell at retail for less than \$15.00. The "inside" shop system is more highly developed than in other clothing centers, although it is generally estimated that two-thirds of the work is done in contract shops. The relation of the "inside shop" to the "outside shop," or contract shop, is peculiar to Rochester, the contractor doing work for one firm only year-in and year-out. As is usual in this industry, there is a great deal of home work done, principally felling and finishing. Most of the "outside" shops give out their finishing and some of the "inside" shops, as well.

##### *The Workers:*

The majority of the workers are American-born and of foreign extraction. Of the foreign-born women, 41.6 per cent are Italians, 28.5 per cent are Germans. (Vol. 2, Report on Condition of Women and Child Wage Earners in the U. S.) Of the men, the cutters are for the most part of German extraction. Women constitute nearly two-fifths of the workers. The average age of both men and women would be between thirty and thirty-five. With regard to the general appearance, their paleness and

nervousness is very noticeable. A large portion of them wear glasses.

*Condition of the Workers:*

The floors were very dirty in twenty of the thirty factories inspected, although the cutting room was generally in good condition. The toilets in general were neglected, nine establishments having very dirty water closet apartments, and fourteen or more no windows to outer air.

With ten exceptions, all the factories were using artificial light — generally electricity — when inspected. The inspection, however, was made on very dark days. All operators worked by completely shaded electric lights, except in outside shops, where unshaded gas burners were in use. The natural lighting is so good in these shops that the workmen do not need artificial light except in the early morning and at night. The bad lighting in the case of "fellers" has already been noted.

The air is not noticeably bad except in the outside shops, but in only two cases was there forced ventilation, in one factory a system of forcing in hot air.

*Processes in the Trade:*

The principal processes are cutting, machine operating, felling and pressing. The cutters are invariably men, and the operation is performed by means of a heavy knife, which is worked by power, a number of thicknesses of material being cut at once. The sewing machines are also worked by power, which the operator regulates by foot pressure. The machine most generally in use, No. 31-15, makes twenty-two hundred stitches a minute; another machine in general use, No. 31-35, makes eighteen hundred stitches a minute, and No. 122-W.-1, a double-needle machine and the most difficult of operation, makes seventeen hundred stitches a minute. These figures are of course approximations. Many factors affect the number of stitches averaged by an operator, such as the size of the stitch, the length of the seam, the grade of work, etc., so that it is impossible to lay down any hard and fast rule. Foremen and employees invariably say that absolute

concentration of the eyes on the point of the needle is necessary on the part of the operator. The fellers and finishers sew by hand and at a very great speed. These perform whatever hand work may be required on the garments. The pressers do their work by means of a gas-heated iron. Their equipment differs in the various shops. It is usual for the garment to be forced against the hot surface by the iron from below, the presser bearing down on a treadle with all the weight of his body. The gas used to heat the irons of the pressers is liable to escape by leakage or noncombustion, and to vitiate the air of the room. Carbon monoxide poisoning causes headache, sore eyes, dizziness and nausea, as well as a general condition of anaemia. Fellers or finishers appear to suffer from eyestrain, judging from the great number who wear eyeglasses. Almost all of them were placed away from the windows and had to depend for light on unshaded, or partially shaded electric lights. A great deal of felling is done in the homes. (See Vol. II, Report on Condition of Woman and Child Wage Earners in the United States.)

*Dangerous Elements:*

Operators suffer from the system of speeding up. The rate at which machines are run has already been noted, as well as the concentration required. Headache, eyestrain and neurasthenia are the results of these conditions. Garment workers are, as a rule, anaemic. In all the factories visited with two or three exceptions fuzzy dust was found on the floors in all operating rooms, and in most cases piled up under the machines. The hours are from seven to six, with an hour for lunch, and four to five hours on Saturday, and it is probable that at certain times of the year the majority of the factories work overtime. Vol. 2 of the United States government investigation of conditions of women and child wage-earners in the United States shows that sixteen out of twenty-five Rochester clothing factories were found working overtime.

## V. THE WORK DONE BY WOMEN IN FACTORIES.

A great deal of hard, laborious and physically exhausting work is still done by women. The work done by women in laundries is typical of such trades. In trades where women work more or

less in competition with men, their work is apt to be heavy and hard, and to be performed under the most difficult conditions. Two foundries where women coremakers are employed were inspected. The work is dirty and disagreeable, and is done standing in excessively hot atmosphere. The trays of cores, which must be lifted by the women, weigh sometimes as much as 80 pounds. These two foundries work a ten-hour day. No provision is made for the comfort or convenience of the women.

In a large meat-packing plant employing at times over one hundred women, the women in the trimming and sausage rooms work side by side with the men who set the pace for the work. They stand at their work all day on floors covered with water and slime. Most of them wear heavy rubber boots, which they had to provide themselves to keep their feet dry. Only Polish and German girls were employed, as American women could not stand the hard work and long hours on their feet.

This continual standing is one of the worst features of a large part of the work done by women in factories. Much of it is quite unnecessary and may be due to the fact that both the management and inspection of factories are usually in the hands of men who are apt to be ignorant or careless of the effect on women of prolonged standing. Many processes which now require the worker to stand could be easily adapted to a sitting posture. The practice varies in different establishments in the same industry. One manufacturer will state emphatically that such and such a process cannot be carried on if the workers sit, and perhaps in a shop a few blocks away the workers will be found comfortably seated at the same process. Even in branches of industry where constant sitting is not possible, such as loom-tending, carding and winding in textile mills, seats can be provided near at hand where the woman worker can take occasional moments' rest while work is running smoothly. The law requires the provision of seats for women in factories, but compliance with the law is unusual.

Most of the work done by women in factories, however, is injurious to health, not so much on its physical side, but on account of the nervous strain involved in the extreme monotony of the processes and the speed with which they are carried on. Modern

industry has been developed chiefly by men for men. Newer and faster machines are continually being introduced. In the clothing industry women operate machines that take from 1,500 to 2,000 stitches a minute. In the paper box trade girls will "stay" or "fill-in" upwards of 2,000 boxes a day, involving over 4,000 pressures with the foot. Automatic die-presses open and close every two seconds, and within this time the woman worker must remove the printed sheet and insert a fresh one. In the knitting mills of Utica, machines take 3,500 stitches a minute. Unlimited speed and unlimited production is the manufacturer's dream, but modern machine production is taking no account of the strain upon women workers of long hours at such monotonous and nerve-racking work in destroying their health, and thus lowering the efficiency of future generations of workers.

## VI. HOURS OF LABOR.

Although for the reasons noted above a detailed study was not made of the most important of all factors affecting the health of women workers,—the daily and weekly hours of labor—the investigators were able to gain much incidental information from both workers and employers in factories in New York city and elsewhere.

The regular hours of labor of women in factories up-State are undoubtedly longer than in factories in New York city. The sixty-hour week and ten-hour day are the rule. Only two factories were noted where the regular working hours were as low as fifty-four per week. The working-day usually begins at seven or seven-thirty, and ends at five-thirty or six, with from half an hour to an hour for luncheon. In one large textile mill the working day began at 6:30 A. M. and continued until 6:15 P. M. with forty-five minutes for lunch. This meant for the worker almost twelve hours inside the factory, daily, and a working time of eleven hours. The owners of this establishment kept within the sixty hours legal limit by stopping work at noon on Saturdays. In this mill the inspector found a pale young girl leaning against the wall for a moment's rest, and inquired whether she did not find it a rather long day. "It's an awful long day," she sighed, and when told that many legislators in the State were trying to

shorten the daily hours of work, she said, emphatically, "Well, they just can't do it quick enough for me."

In the districts where the workers live, the streets are empty and the houses dark by nine at night;—"help wash the dishes and go to bed;" "go to bed right after supper, too tired to go out;" "tried going to night school, but was too tired to study;" "sometimes go out Saturday nights, but would rather go to bed;—these are some of the answers given by the girls when asked what they did in the evenings. On Sundays a working woman must wash and mend her clothes and frequently those of the men folk of the family. To keep her health that she may continue just to labor sixty hours a week, at unremitting monotonous toil, the girl worker must give up that social life and recreation so eagerly desired and so necessary for youth, must put aside the yearning to read and know, which is often just as keen as a desire for pleasure. If by these means the woman worker keeps her health, what preparation is such a life for the varied duties of wifehood or motherhood, and what wonder that most workers refuse to make this choice.

Ten hours a day is of course exclusive of time for meals. Where one hour for lunch is allowed, the worker spends eleven hours a day inside the factory. Many women workers are unable to live near their work, and must allow from half an hour to an hour to go to and from the factory. A ten-hour day means for most women workers 12 or 13 hours away from home.

In New York city, while the regular hours of labor are apparently shorter, long periods of overtime eat up the seeming gain. Shops that have posted 58, 56, 54, or 51 hours a week may have overtime which brings them up to and beyond the sixty-hour mark from four to six months a year. In shops in which overtime is permitted, too, it is extremely easy for employers to violate the law, and, as inspectors of the Department of Labor have testified, almost impossible to get convictions. Girls who have kept account of their hours in the busy season at rush time in the laundry, clothing, artificial flower and printing trades find that they have frequently worked sixty-two to eighty-one hours per week, and ten to fifteen hours a day. In the artificial flower industry, according to the study made by the Committee on Women's



Work of the Russell Sage Foundation, while only 7 per cent of the 74 firms investigated had regular working hours of more than fifty-four, 63 per cent had overtime, ranging from 55 to 72 hours per week. Women who work in trades where there is much overtime agree that no amount of slack time later on makes up for the exhaustion consequent to the long day of 12 to 14 hours. Miss Josephine Goldmark, who has made a splendid study of the effect of long hours on women's physique, testified before the Commission on December 20, 1911, "Overtime work is injurious to health because it means work after the physical organism is overtired. No money can repair the wasted energy that the organism suffers from overtime."

Many employers seriously object to overtime and state that it does not pay in the end. If a girl works till nine or ten one night her output the next day falls off correspondingly. These employers would welcome a limitation of the daily hours of work which would bear upon all manufacturers alike. The New York State law, permitting overtime regularly and irregularly, is the only law of its kind in the United States without a flat limit to the daily hours of work. Most serious of all, it is practically impossible to prove violations of the sixty-hour law, which for this reason is not enforced in the very trades where women most need its protection. The limitation of daily hours of work is the only logical corollary of the limitation of the hours of the working week.

That regular working hours of ten per day, six days in the week, and the irregular working hours ranging from nine to fourteen per day, are bound under the best conditions to injure the health, lower the vitality, and eventually shorten the life of the average woman worker, even though her weekly hours do not exceed sixty, does not require elaborate proof. At every hearing of the Commission physicians, health officers, trade-union members and others testified from practical experience to the injuries to women's physique and nervous system of long hours and overtime.

Dr. Delancey Rochester, a physician with twenty-seven years' experience both in private practice and in connection with the Buffalo General Hospital and County Hospital, stated at the hearing of the Commission held in Buffalo: "I am firmly in favor of the *eight-hour* labor law myself

(for the working women). I think it ought to be enforced very firmly. The eight-hour law is proper and ought to be compulsory."

Dr. George Goler, a practising physician for twenty-two years, and health officer of the city of Buffalo, testified before the Commission: "Speeding up is very detrimental to the health of the worker. The faster you speed up the organism the sooner you wear it out. No woman should be employed more than *six hours* in any one day."

Dr. Wood Hutchinson, of New York, testified that "One of the most important measures to prevent tuberculosis among factory workers would be the reduction of hours of labor. If the worker only worked *eight hours* a day, he or she would be able to keep in good, vigorous condition to resist the attack of the disease. The weekly hours of labor of women in factories *should not be in excess of forty-eight.*"

Louise Stritt, Secretary of the Garment-Makers' Union of Utica, and a garment worker herself, testified at the Utica hearing of the Commission: "We are in favor of *forty eight hours a week, eight hours a day*, for women workers."

Dr. Angeline Martine, practicing physician of Utica, with a large practice among the working women, stated before the Commission that "Many diseases of working women are attributable to long hours. I would favor *forty-eight hours a week* for women."

Mrs. Florence Kelley, Secretary of the National Consumers' League, said, in her testimony before the Commission: "The present New York law for women is not enforceable and is illusory, and therefore demoralizing to all concerned. The working-day for women and minors should not exceed ten hours in any case; the working week should be limited to fifty-four hours with the option of nine hours on six days, or ten hours on five days and four hours on Saturday. This, however, *is an immediate step merely, on the way towards a working week of forty-eight hours and a working-day of eight hours for women and minors.*"

Miss Melinda Scott, President of the United Hat Trimmers of New York and Newark, representing the Legislative Committee of the Women's Trade Union League, said: "We recommend a bill limiting the working hours of women to *forty-eight per week*. The bill should also shorten the period

during which the factory may remain open, otherwise the law is a dead letter and cannot be enforced."

From these statements, taken in connection with the facts, it is evident that the reduction of the hours of labor of working women is a very practical and immediate necessity, and one that becomes more urgent every day, with the continued introduction of new and speedier machines, increasing intensity of modern production, and the correspondingly greater strain which is put upon the worker. It will be useless to investigate the effect of special processes or unsanitary shops on the health of women workers as long as such hours prevail in all industries alike. With long hours and overtime, work can be injurious though carried on in an industrial palace, provided with special wash rooms and lunch rooms and adorned with Perry prints. With shorter weekly hours and a normal working-day, the present unhealthfulness of many trades will diminish. We shall then be in a better way to determine, apart from questions of duration, what trades or processes are specially injurious to the woman worker, and to act accordingly with intelligence and promptitude.



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**APPENDIX V**

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**NOTES ON AN INDUSTRIAL SURVEY OF A  
SELECTED AREA IN NEW YORK CITY  
WITH RESPECT TO SANITARY  
CONDITIONS IN THE  
FACTORIES**

By PAULINE GOLDMARK, *Associate Director, New York School  
of Philanthropy.*

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# NOTES ON AN INDUSTRIAL SURVEY OF A SELECTED AREA IN NEW YORK CITY WITH RESPECT TO SANITARY CONDITIONS IN THE FACTORIES

Prepared by PAULINE GOLDMARK, Associate Director of  
of the School of Philanthropy, in charge of the  
Bureau of Social Research, with the co-operation of  
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dent in Columbia College, and HARRY M. BREMER, a  
student in the New York School of Philanthropy,  
gave substantial assistance.

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This report deals with conditions affecting 10,000 factory work-  
ers in a selected area. Such a comprehensive district study has  
this advantage over an examination of selected industries — that  
it includes all the factories whatever the trade or processes. The  
conditions found may be considered fairly representative of those  
prevailing throughout the city, since neither good nor bad points  
have been especially sought out.

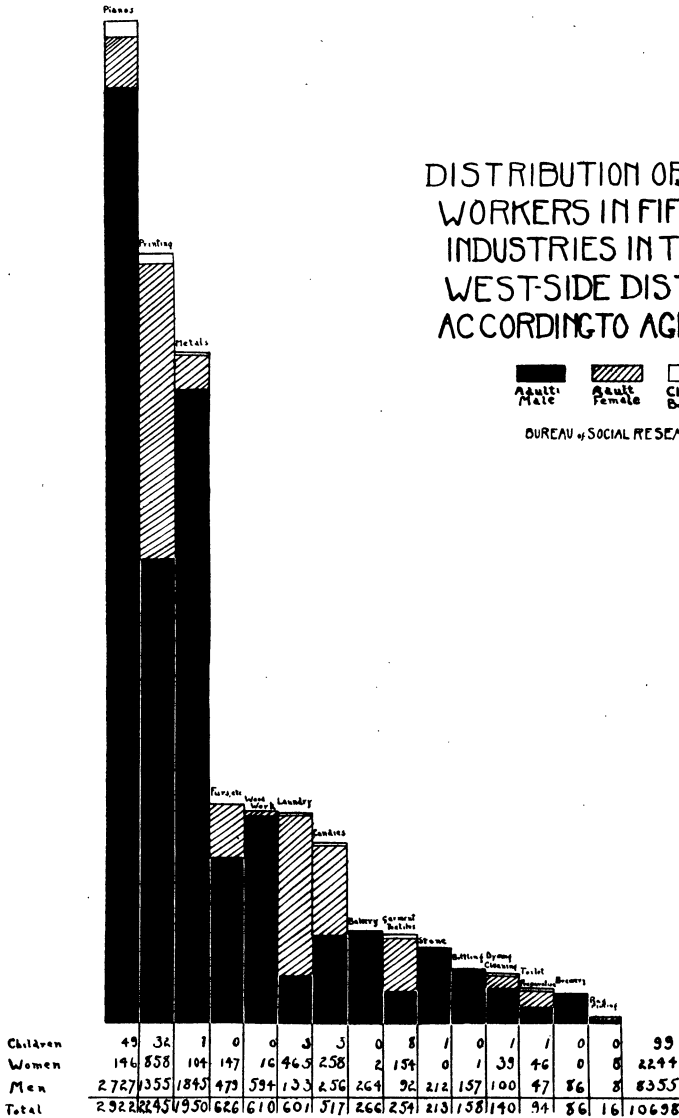
The inspections for this survey were made with a view of de-  
termining the sanitary conditions as they exist in the factories.  
In making such a study it is important to bear in mind that all  
the factors must be noted which affect the health and working  
capacity of the individual employee. In other words, the cleanli-  
ness, sanitary conveniences and comforts, heat, light, and venti-  
lation of the premises are first to be examined; and further the  
effect of this environment upon the workers — that is, the factory  
hygiene, must be considered. For this purpose such factors as  
exposure to heat and cold, sudden changes in temperatures, hu-  
midity of the atmosphere, eye strain, speeding, standing and all  
special muscular exertion should be carefully estimated. In this



# DISTRIBUTION OF 10698 WORKERS IN FIFTEEN INDUSTRIES IN THE WEST-SIDE DISTRICT ACCORDING TO AGE AND SEX.

Adult Male  
 Adult Female  
 Children Both Sexes

BUREAU OF SOCIAL RESEARCH







No. 1.—LAUNDRY. Wash-room located in the rear of ground floor. Concrete floor is broken in many places. Pools of water collect and are occasionally swept into a drain. Rags and bits of paper are strewn on the floor. Soiled clothes are heaped upon the floor, barrel and boxes. The room is cold, although clouds of steam rise from the washing machines and from the mangle which stands in the front of the room.





particular survey, however, it has not been possible to give adequate consideration to all these subjects. Only in regard to cleanliness and sanitary conveniences and comforts has it been possible to make a full statistical statement.

The inquiry covers the district in the Middle West Side of New York city which lies between Thirty-fourth and Fifty-third streets and extends from Eighth avenue to the Hudson River. All industrial establishments employing five or more persons were inspected, block by block, excepting packing houses, coal yards and gas houses. In some cases smaller shops were visited in order to study more completely the processes of the industry.

Fifteen industries were found located in 323 establishments, employing 10,698 workers, roughly divided as follows: 78 per cent men, 21 per cent women, .9 per cent children. The following table gives the figures for each industry:

TABLE I.

TOTAL NUMBER AND PER CENT OF MEN, WOMEN AND CHILDREN CLASSIFIED ACCORDING TO INDUSTRIES.

INDUSTRY	Number of Establishments	Number of Men	Number of Women	Number of Children	Total	Per cent
1 Pianos.....	24	2,727	146	49	2,922	27.3
2 Printing.....	25	1,355	858	32	2,245	21.0
3 Metals.....	82	1,845	104	1	1,950	18.2
4 Furs, etc.....	9	479	147	0	626	5.9
5 Wood manufactures.....	42	594	16	0	610	5.7
6 Laundries.....	14	133	465	3	601	5.6
7 Candies and food products.....	12	256	258	3	517	4.8
8 Bakeries.....	60	264	2	0	266	2.5
9 Garments and textiles.....	11	92	154	8	254	2.4
10 Stone, clay and glass.....	7	212	0	1	213	2.0
11 Mineral and soda waters.....	12	157	1	0	158	1.5
12 Dyeing and cleaning.....	10	100	39	1	140	1.3
13 Toilet preparations and chemicals.....	10	47	46	1	94	.9
14 Breweries.....	4	86	0	0	86	.8
15 Rags.....	1	8	8	0	16	.1
Totals.....	323	8,355	2,244	99	10,698	100.
Per cent.....		78.09	20.98	.93	100	.....

Classifying these 10,000 workers according to the chief occupations of the two sexes, it will be seen that piano factories, printing shops and metal works giving employment to 71 per cent of the men, while printing shops, laundries and candy makers are the largest employers of women, engaging 70 per cent of the total number.

Bearing in mind that this inquiry is to determine the physical welfare of the individual workers, we have sought to ascertain in each case *the number of employees subjected to given conditions*, distinguishing by sex whenever practicable. It was found that the grade of facilities often varied greatly in different parts of the same establishment. A consistent effort was therefore made to determine in each case the respective number of persons affected. This detailed method of recording takes more time and effort than a general grading for the entire factory, but it gives a far more accurate picture of actual conditions.

#### CLEANLINESS.

Conditions were graded according to rough working tests, which will be explained under separate heads. Thus degrees of cleanliness are indicated by four grades: "A," meaning "clean and well-kept;" "B," "fairly clean;" "C," "dirty;" and "D," "very dirty." The extremes could be determined without difficulty, but the distinction between "fairly clean" and "dirty" had to be carefully weighed. Between these two grades lies the line dividing the legal from the illegal condition, judged by the requirements of the labor law.

In estimating the grade of cleanliness of shop rooms, the state of floors, walls and ceilings has been considered in relation to the apparent amount of cleaning done and the efforts to remove accumulated dirt. This grading has not been determined by the presence of waste and other products of special processes unless it appeared that the efforts to remove them were entirely inadequate. In general the work shops are dingy and mean and sadly in need of thorough scrubbing, new paint or whitewash. Of the 10,000 workers,

7% work in clean and well-kept workrooms.

58% work in fairly clean workrooms.

31% work in dirty workrooms.

4% work in very dirty workrooms.

The full table follows:

TABLE II.

TOTAL NUMBER AND PER CENT OF MEN, WOMEN AND CHILDREN CLASSIFIED ACCORDING TO GRADE OF CLEANLINESS IN WORKROOM.

CLEANLINESS	Number of Men	Number of Women	Number of Children	Total Number	Per Cent
A.....	246	445	31	722	6.8
B.....	4,751	1,359	63	6,173	57.7
C.....	2,892	423	5	3,320	31.0
D.....	466	17	0	483	4.5
Total.....	8,355	2,244	99	10,698	100.0

## SANITARY CONVENIENCES AND COMFORTS.

The condition of the toilets is less satisfactory. In grading them for cleanliness, the condition of floor, seat and bowl was noted; also the adequacy of the flush. The light and ventilation of the compartment could not be determined by any strictly scientific tests. "Well ventilated" indicates that the air is odorless and that the compartment is supplied with air from some other source than the workroom proper. "Well lighted" means that the illumination is sufficient to enable one to see all parts of the toilet and determine its cleanliness. In a great many cases the inspector had to strike a match or use an electric flash-light.

Summarizing conditions that affect the men, it appears that

- 4.5% use A grade toilets.
- 37.6% use B grade toilets.
- 48.1% use C grade toilets.
- 9.8% use D grade toilets.

---

100. % Total.

In other words, 58 per cent have accommodations that are dirty or very dirty. In addition 34 per cent have toilets that are dark or semi-dark.

The women fare better:

- 18.7% use A grade toilets.
- 63.8% use B grade toilets.
- 15.8% use C grade toilets.
- 1.7% use D grade toilets.

---

100. % Total.

Only 17 per cent of the women have accommodations that are dirty or very dirty and 16 per cent have toilets that are dark or semi-dark. The plumbing on the whole is in good condition. The flush is insufficient in only a few cases.

It was found that 76 per cent of the toilets have outside windows. This in itself is no indication of sufficient ventilation, as the windows are sometimes nailed up and are often mere slits opening on a shaft. Careful inspection of actual conditions shows that 65 per cent of the men and 85 per cent of the women use toilets that are well ventilated.

As to the location of the toilets,

3.5% are in back yards.

9.0% are in halls.

87.5% are in compartments or rooms connected with the  
—— workrooms.

100.0% total.

The yard toilets belong principally to the bakeries.

Five per cent of the toilets are separated from the workrooms by dwarf partitions, that is to say, the partitions do not reach to the ceiling. In all these cases, only men are employed.

As to the separation of toilets for the two sexes, decency is preserved to some extent by placing the apartments for men and women on different sides of the workroom, or, perhaps, on separate floors of the establishment. Ninety per cent of the toilets are thus separated.

The arrangement is far less satisfactory if the closets for the two sexes adjoin, for the partitions are not always complete and sufficient. Even if such toilets are separated by solid partitions, their entrances are so close together that they can not be effectively screened.

The number of toilets is not always adequate. According to a standard accepted in many States, one toilet should be provided for 25 workers. Yet 15 per cent of the women and 3.9 per cent of the men are working under conditions that fall below this standard. In 4 establishments, employing 17 men and 9 women, both sexes use the same toilet.



Shops are counted as having inadequate washing facilities when no water at all is supplied or only a faucet with odd pails or tubs, when more than 20 workers use one basin, or when there is no towel supply. Judged by this standard, washing facilities are inadequate for 67 per cent of all employees (bakeries are not included). Hot water is supplied for only 24 per cent of the workers. These figures will be more significant when considered under the separate trades which vary in respect to the dirtiness of the work.

The provision of some private room for the women is one of the essentials of decency in all occupations where the women change their clothes, beside being a real necessity in case of sudden illness. Separate dressing rooms are rarely supplied. Including in the number all rooms however small and insufficient for the purpose, we find that 36 per cent of the women do not have this accommodation. But even if a dressing room is supplied, we can not be sure that all the workers are allowed to use the room. When immigrants are employed it is not unusual to reserve the room for the use of the American girls and prohibit the others from entering it.

A separate lunch room is set apart in only one factory.

#### HEAT, LIGHT AND VENTILATION.

Methods of heating were noted in all establishments. Bakeries and breweries, however, are not included in the following table, because the temperatures in bakeries will later be treated in detail, and because in breweries refrigeration is essential to the process and calls for special comment.

91.1% of the employees work in rooms heated by central heating plant (steam or hot air).

3.3% of the employees work in rooms heated by stoves.

4.4% of the employees work in rooms heated by process of manufacture.

1.2% of the employees work in unheated rooms.

---

100. % total.

Heating by means of the process of manufacture occurs chiefly in the metal trades, and in the laundries. It is obviously unsatis-

factory, inasmuch as it creates an uneven temperature — excessive in some parts of the room and deficient in others. Near the drying chambers of the laundries, for instance, it may be so extreme as to require special ventilation to reduce it.

Figures on the illumination of workrooms are lacking because of the difficulty of applying tests. In the absence of exact and practical standards, we have considered lighting inadequate only when artificial light is used in the daytime. We have thus confined ourselves to the most elementary tests of eye strain, and applied it only in the allied trades of printing and binding that require the use of the eyes for close work.

Fresh air is not considered a requisite in factory workrooms; systems of ventilation are almost entirely wanting, and even devices for admitting fresh air are seldom used. The following figures show the relatively small proportion of workers benefited either by complete ventilating systems or by even such simple devices as fans, wheels in windows, etc.

Of the total number of employees,

3.9% work in rooms with ventilating systems.

11.5% work in rooms with ventilating devices.

84.6% work in rooms without ventilating systems or devices.

---

100. % total.

Ventilation is incapable of exact measurement without chemical analysis of air samples. As we were not equipped for such work, we were unable to test the adequacy of such ventilation as was provided. We shall discuss the lack of ventilation only when it is grossly deficient, as, for instance, when dust and harmful vapors imperil the health of the workers.

We are, however, not primarily concerned with the dangerous occupations which may subject the workers to contact with poisons, inhalation of noxious gases, etc. The defects as to sanitation and lack of physical care which we point out are found in such trades as candy making, book binding and laundries — none of which can be regarded as dangerous in themselves.

The separate industries, following in the main the classification of the Labor Department, will be treated in detail. We shall describe the processes of manufacture only in so far as they are immediately connected with questions of sanitation and health.

We shall explain, as far as possible, whether there is anything inherent in the trade which may account for the varying conditions found.

#### GENERAL SUMMARY.

It will be seen that, both as to cleanliness and sanitary conveniences and comforts, many changes are to be desired before the work places will be fit habitations wherein 10,000 wage-earners must spend the longest span of their waking hours.

The law as to cleanliness and sanitary conveniences is defined in sections 84 and 88 of the Labor Law, namely:

Sec. 84. "The walls and ceilings of each workroom in a factory shall be lime washed or painted, when in the opinion of the Commissioner of Labor, it will be conducive to the health or cleanliness of the persons working therein. Floors shall be maintained in a safe condition and shall be kept clean and sanitary at all times."

Sec. 88. "In every factory there shall be provided suitable and convenient water-closets for each sex, in such number as the Commissioner of Labor may determine. Such water-closets shall be properly screened, lighted, ventilated and kept clean and sanitary."

The facts revealed in our investigations show clearly that many premises — workrooms, hallways and toilets — are neglected to a scandalous degree. They need repairs, repainting, scouring and scrubbing. Many employers apparently do not realize that they are violating the law when their premises are filthy. Many make no sufficient provision in their running expenses. It is customary in most factories to have the work people sweep up every evening, but this cleaning is hurried and superficial, and should not be allowed to take the place of thorough housecleaning at regular intervals. There is the greatest diversity in practice. For instance, one excellent laundry employs a cleaning woman, who is a regular member of the force and works full hours. And the best candy factory keeps two men steadily on the job. Such ample provision is rare.

Another instance is probably more characteristic. The shop occupies two floors, the processes create dust, and yet the entire cleaning for 150 workers is done by one woman, who comes in for one day a week, and is paid \$1.25. She cleans the work rooms, but says that, as far as she knows, no one ever washes the toilets. Needless to add, these workrooms and toilets were found to be graded C.

Many of the toilets, especially, are indescribably dirty, dark and unventilated. If new fixtures are not installed, the seats and bowls need to be thoroughly scoured, disinfected and repaired. If the floors were built of concrete or some non-absorbent material, they could be kept clean and dry. Moreover, lighting of the toilets is essential if cleanliness and decency are to be habitually maintained. For that purpose, they must be painted a light color, and if daylight does not suffice, artificial illumination must be ample.

Employers are wont to shift the blame on their employees, asserting that the latter will not keep the accommodations clean. There is no doubt that both sides are to blame. But all the workers are not indifferent. Many women complain about the lack of cleanliness and regard it as a distinct grievance. Moreover, if the employees are so untaught as to leave these places unfit for human use, they must be compelled, in the interest of their fellow workers, at least, to observe elementary decencies. Inasmuch as the workers are on the employer's premises, the obligation is clearly laid upon him to keep his factory in proper condition and to provide reasonable comforts for all of his employees. Neglect, dilapidation and filth should not be suffered in any factory.

In the matter of ventilation our inquiry brings out a deplorable failure to provide for the workers. For lack of data, as already indicated, we omit discussion of general room ventilation. We have examined, however, with some care the means of local or forced ventilation used to remove dust, poisons and vapors created in the processes of manufacture. Of the factories using such ventilation there is scarcely a single one which has installed satisfactory apparatus at every point where it is needed. Even when the equipment is supplied, it is not always in use. Moreover, the forced draft often is not strong enough to draw off the waste products thoroughly.

The provisions of the Labor Law, such as they are, are stated in sections 81 and 86:

Sec. 81. "All machinery creating dust or impurities shall be equipped with proper hoods and pipes and such pipes shall be connected to an exhaust fan of sufficient capacity and power to remove such dust or impurities; such fan shall be kept running constantly while such machinery is in use; except where, in case of wood-working machinery, the Commissioner of Labor, after first making and filing in the public records of his office a written statement of the reasons therefor, shall decide that it is unnecessary for the health and welfare of the operatives. . . ."

Sec. 86. "The owner, agent or lessee of a factory shall provide in each workroom thereof, proper and sufficient means of ventilation, and shall maintain proper and sufficient ventilation; if excessive heat be created or if steam, gases, vapors, dust or other impurities that may be injurious to health be generated in the course of the manufacturing process carried on therein the room must be ventilated in such a manner as to render them harmless, so far as is practicable. . . ."

These general requirements, obviously, give no workable tests by which, for instance, one can determine the point at which impurity, temperature or humidity of the air becomes excessive and needs to be corrected by ventilation.

Furthermore, the provisions of these sections for ventilation in special processes are apparently nullified to a large extent by the phrase "as far as is practicable," in section 86. This modification makes it well-nigh impossible to enforce the law, as it gives the employer an easy loop-hole of escape from the orders of the Department. In consequence the workers are very imperfectly or not at all protected from one of the greatest perils of industrial life.

Section 17 in the Labor Law regulates the use of seats for women:

"Every person employing females in a factory or as waitresses in a hotel or restaurant shall provide and maintain suitable seats for the use of such female employees, and permit the use thereof

by such employees to such an extent as may be reasonable for the preservation of their health."

This provision of the law is vague and, in practice, is of little value in securing relief. As we shall note in the following reports, women are required to stand in candy factories, laundries and printing shops for hours at a time, often for the whole day. There can be no doubt that long hours of standing are injurious, and principally so to young girls. Medical testimony bears out this point. It is important that a further intensive study should be made of all the occupations in which women stand all day, in order that some system of reliefs or alternation of work may be instituted at least in occupations in which it has been conclusively proved that seats are impracticable.

It is abundantly evident from the following reports that manufacturers provide most inadequately for the daily comfort of their employees. Since human efficiency depends upon physical welfare, it is strange that it should not be more seriously considered and provided for. There can be no doubt that the health of the workers suffers from the hardships and discomforts which they encounter in their daily work. Women are particularly affected by this lack of care. It adds materially to the strain and fatigue caused by long hours of work. Many of these evils are not inherent in the processes of manufacture and are caused almost entirely by the ignorance or indifference of the employer.

#### PIANOS.

Piano-making is the largest and most characteristic industry of the district. It employs 2,922 persons, or more than one-third of all the workers considered in this survey. Ninety-three per cent are men, while only 5 per cent are women. This trade leads in the employment of boys. The total number of employees represents something less than one-half of all piano-workers in the city.

The various branches of the highly specialized piano industry are represented by factories manufacturing and "assembling" or putting together the parts of (1) upright and grand pianos, (2) player pianos, (3) ordinary actions, and (4) pneumatic actions.

There are altogether about 115 piano and action factories in

New York City, and 24 are located in the district; these include some of the largest factories in the city, viz., the largest player piano factory, the largest ordinary action, and largest pneumatic action factory. The distribution of the factories according to size may be seen from the following listing:

Number of Workers	Less than 5	6 to 15	16 to 24	25 to 49	50 to 99	100 to 149	150 to 199	200 to 249	250 to 299	300 and over	Total
Number of Factories..	1	.....	7	1	7	2	.....	2	1	3	24

The factories manufacture for the most part middle-grade pianos, although two turn out instruments of superior quality.

The factories are mostly housed in old buildings, some of them dating back 40 or 50 years. A few have been constructed within the last seven to ten years, but even these can hardly be spoken of as modern factories. Some of the buildings originally had no lighting system installed and some are still without lighting equipment of any kind or have had the gas pipes or wires put in across the ceiling of the room. Seventeen are housed in special factory buildings; five are in loft buildings; two are in converted tenements.

In spite of the age of most of the buildings, the general state of the work rooms is better than might be expected. The floors, walls, and ceilings are fairly clean, because, as a rule, there is no material used in the work which accumulates as waste on the floor. Exceptional is the condition of things around the benches of the men who prepare the wood for the varnish where the filling and staining materials collect on the floor, and, when left for years (in some cases for ten or fifteen years), form a mound around the bench. There is nothing injurious in this, however, as it becomes hard and can be swept clean, presenting a surface like asphalt. Varnish and oils also adhere to the floors and walls, but neither can these be said to be insanitary. Of the total number of employees, 67 per cent work in clean or fairly clean work-rooms; 33 per cent in dirty or very dirty rooms.

Conditions in regard to toilets are much more open to criticism. In some cases where there has been no original provision for them, toilets have been built into the shop room. The partitioning which separates them from the shop is only a partial protection for the air of the room.

The following table shows the number of males subject to certain specific conditions. It shows, for instance, that out of the total of 2,776 males, 114 are using toilets of D grade which are also semi-dark; that 757 males are using toilets of C grade in which ventilation is inadequate.

TABLE III.  
NUMBER OF MALES AFFECTED BY CONDITIONS OF WATER CLOSETS.

GRADE OF CLEANLINESS	ILLUMINATION			VENTILATION		TOTAL	PER CENT
	Light	Semi-dark	Dark	Good	Poor		
A.....	208	24	.....	196	36	232	8.3
B.....	777	80	40	723	174	897	32.3
C.....	934	462	90	729	757	1,486	53.6
D.....	30	114	17	24	137	161	5.8
Total.....	1,949	680	147	1,672	1,104	2,776	100.0
Per cent.....	70.2	24.5	5.3	60.2	39.8	100.0	

Out of a total of 255 toilets, 248 were within the shop, 4 were in halls, and 3 were in yards. Of those inside the shop, 247 were separated from the room by full partitions; 58 had no outside windows.

The relatively small number of women in the trade are supplied with fairly clean toilets, which are well lighted and well ventilated. But in one factory employing eight women their toilet is alongside that for men, the doors are separated by only a few inches, no screening is provided for the approach, and the doors open to the full view of the shop.

Adequate washing facilities are practically unknown in this trade. Hot water is supplied for only 8 per cent of the workers,—a gross deficiency in a trade where turpentine, varnish, and stains are constantly handled. Towels are supplied to .3 per cent of the workers. In only one factory is a special wash room provided for men. In four factories, employing 144 women, a dressing room is provided, but in no case are lockers supplied.



Only a very small percentage of the women are subject to the worst conditions cited, because most of them,—about 120, in fact,—are employed by two large factories which have paid particular attention to their needs. Their work rooms are separated from those of the men; dressing rooms and toilets of the two sexes are divided not only by partitions, but by location in separate parts of the factory.

The women are employed at light glue work connected with the making of pneumatic actions, such as gluing together and slipping into place little leather washers, and gluing rubberized cloth into the bellows parts. They also glue on felt and cut apart and trim the various little parts of the action which have been glued in common to a piece of felt or leather. Stools are supplied everywhere, but in no place have they been provided with backs.

Because of the nature of this investigation, we shall give no description of any processes except those which involve discomfort or danger to the health of the workers. The varnishing department prepares the wood for the varnish, puts on the coloring matter suited to the various kinds of wood, and applies the varnish. The preparation of the wood is known as "filling" and "staining." Coloring is known as "coloring." There are generally two groups of varnishers: the men who apply the first coats and those who apply the last or "flow" coat. This must be exceedingly smooth and even, and present a good lustre. Its application naturally demands more skill and knowledge than the first varnishing.

To determine the number of persons affected by irritating dust and vapors is important. The following table presents the facts in this connection:

TABLE IV.

NUMBER OF FACTORIES AND ROOMS IN WHICH VENTILATION IS NEEDED AND NUMBER OF PERSONS AFFECTED.

ODORS OR PARTICLES PRESENT IN THE AIR	Number of factories affected	Number of rooms affected	Number of persons affected	
			Male	Female
Turpentine.....	18	45	324	.....
Glue.....	3	7	28	61
Potash.....	1	1	5	.....
Saw dust.....	2	2	27	.....
None.....	.....	2	68	80
Total.....	19(a)	57	452	141

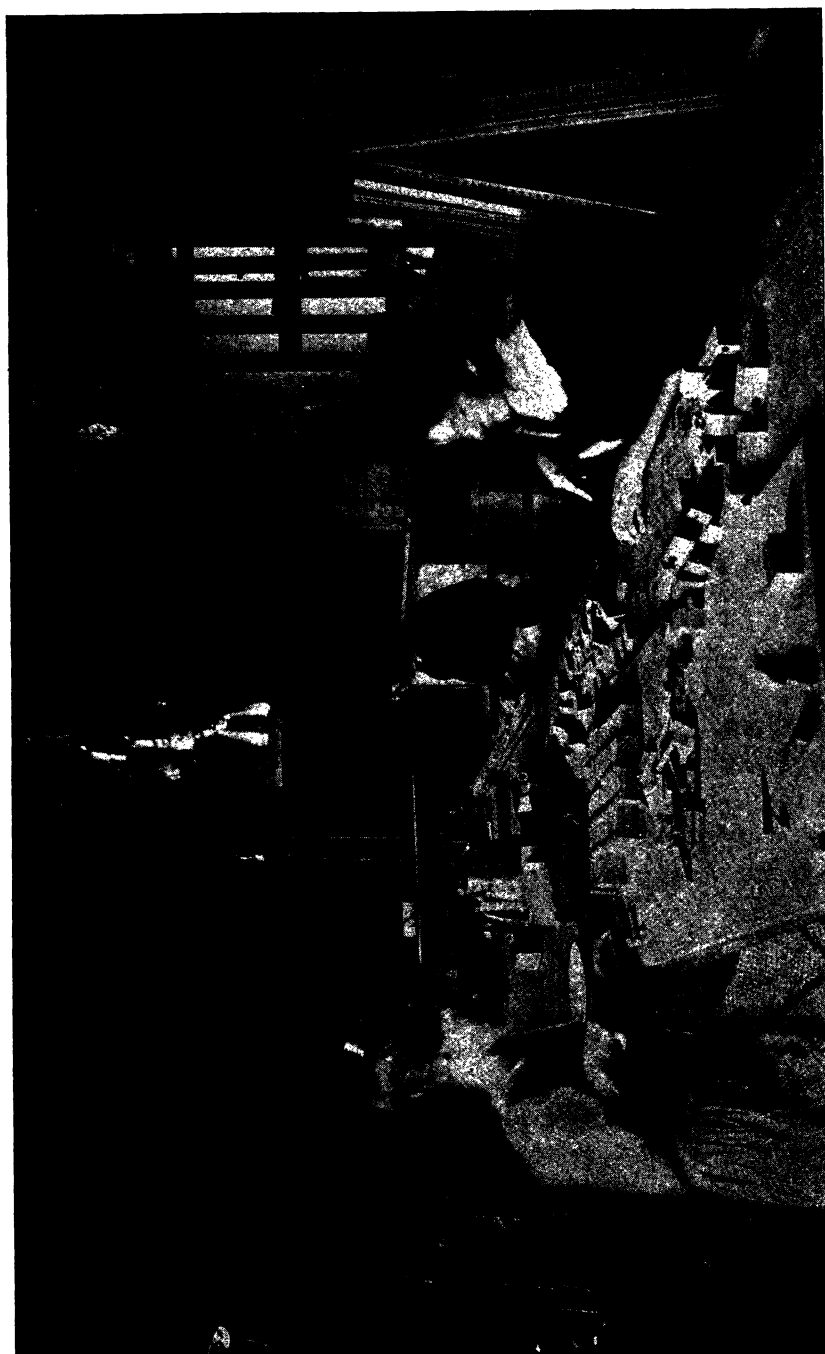
(a) Shows total number of factories affected. Some factories are entered in more than one classification.

Nearly all the piano factories are poorly or not at all ventilated. The larger number receive fresh air only through the cracks of the building and occasionally through an open door. This is due to the fact that the varnish work as well as the delicate actions must be protected from dust and weather. Usually the varnish rooms are not ventilated at all, and the windows are kept tightly shut so that as little dust as possible will get into the varnish while it is being applied.

The danger to the varnishers arises from the fumes of the turpentine, which when confined in an ill-ventilated room cause discomfort or sickness. The men as a rule do not seem to be impressed with the dangers of disease from turpentine fumes, saying that they are sick for a little while when they first start in, but they get used to the odors, and that is the end of it.

According to the investigation of the Illinois Commission on Occupational Diseases, the effects are especially serious from long continued inhalation of the vapors; nausea, faintness and often diseases of the kidneys, such as Bright's disease, may result. Better ventilation is the remedy. Bad air conditions are found especially where the last, or "flow," coat of varnish is put on. "Flowing" is always done in a small room, either partitioned off or built for the purpose, where the temperature is kept up to about 80 or 85 degrees in winter time and runs much higher in summer. In one factory where thermometer readings were taken, the following results were obtained: in the "flow" coat room the temperature was found to be 88 degrees, and the foreman stated that it was frequently 90 degrees; there was no ven-





NO. 4 PIANOS. Girls doing glue work on pneumatic actions for player pianos. Note the poor lighting by unprotected incandescent bulbs.





tilation except through cracks. In the varnishing room the first dry bulb reading was 77 degrees, and the wet bulb was 73 degrees; at the second reading the dry bulb showed 78 degrees, and the wet bulb 69 degrees. These were taken at 15-minute periods. The rooms are kept particularly hot so that the varnish will work more easily.

For the reasons just given, practically no efforts are made to secure better ventilation. It would probably be possible to improve the air of the rooms and at the same time keep the dust out by tacking cheese cloth over the window openings. If enough heat were provided, the air could then be kept at the right temperature for the varnish work.

In the tone-regulating department, where the hammers are filed, a fine woolen dust is created. The hammers are made of felt and the process of filing them down to a satisfactory size releases a quantity of woolen dust into the air to be inhaled by the workmen. This danger is not very serious except in very large factories where one person may devote all his time to the work. Sometimes boys are put at this job.

Special elements of danger are found also in the milling department. In a great many cases no blower system is provided to carry off the sawdust from the machines and the workmen in consequence are covered with it and must inhale some of the dust into their lungs. The men who operate the sand-papering machines are particularly liable to be injured, as this dust is especially fine and insidious. In some places blower systems are provided, but those seen are not adequate.

Practically no protection from dangerous machines exists. The saws, either circular or band saws, jointers, planers, and frazing machines are as a rule without guards. The gearing and belting are almost always left exposed and in many cases, because of their location, they are even dangerous to passers-by. In one instance foot-holds, in the shape of rubber pads, had been placed before the jointers, planers, and saws to prevent the men from slipping on the floor and falling into the machines. In one or two instances it was found that guards had been provided for saws, but according to the foreman's statements, they were never used by the men, as the factory inspectors agreed that they were not practical and did not enforce their use.

There are approximately 145 men and boys who are liable to accidents from dangerous and unprotected machinery. About 50 of them are subject to the more serious dangers of unprotected saws, jointers, planers, and other mill work machinery. In all these cases, obviously, there is absolute disregard of the safety of employees.

In the pneumatic action factories the danger arises from three distinct sources: from unprotected machinery, from varnish fumes, and from acids which are used for cleaning metal work, and in the nickel-plating process. An acid sometimes employed for cleaning off the metal is cyanide of potassium. This is an exceedingly dangerous poison. A year ago a small boy was killed by falling into a vat of it. He absorbed so much of the poison through his skin that he died within a few hours.

There are especial risks in the pneumatic action factories in connection with the metal-working machinery, namely, the stamping machines, the screw machines, and the lathes. As in the case of the wood-working machines, the gearing and belting are commonly exposed and unprotected. In this department also there is metallic dust in the air from improperly hooded buffing machines.

Both gas and electricity are used in the West Side factories. In all cases, except at some of the mill machines, there has been no effort to protect the eyes of the workmen from either glare or reflection. Unprotected flickering gas flames, almost level with the head, are used, or the ordinary unshaded electric bulb. The light is not diffused throughout the workroom, but single lights are suspended above the individual workers. It is true that not much night work is done, and except for the late afternoon work in winter, artificial light is not needed. Nevertheless, there is enough of such work to make the question of proper illumination an important one. In the large number of instances where artificial light has to be used all day there is also no protection from glare. The constant use of artificial light during the day is necessary for 362 men and 18 women. Every one of these persons was found to be using individual concentrated lights, and, therefore, was subjected to considerable eye-strain.

The piano industry has long been regarded as one of the strongholds of the old German mechanic. But we find that although

the Germans originally were the largest racial element in the trade, they constitute at present probably the second race and possibly the third in number. This is true even if we group together both Germans and German-Americans. The Italians greatly outnumber all other races.

From the following Table (V), it will be seen that out of 818 males who gave information as to their nativity, by far the largest group were Italians, or of Italian parentage, while the next in order were of Germans, or of German parentage.

These figures include both native-born persons and foreign-born who reported as to their nativity.

TABLE V

DISTRIBUTION OF EMPLOYEES REPORTING AS TO NATIVITY, NATIVITY OF PARENTS AND NATIONALITY

NATIVITY AND NATIONALITY	Number of employees
Native born:	
Native-born parents	
American .....	64
Foreign-born parents	
Italian-American .....	29
German-American .....	149
Bohemian-American .....	18
Irish-American .....	31
Scandinavian-American .....	2
Hebrew-American .....	7
Others .....	10
Not known .....	23
Total .....	333
Foreign born:	
Foreign-born parents	
Italian .....	334
German .....	49
Bohemian .....	32
Irish .....	6
Scandinavian .....	23
Austrian .....	5
Hebrew .....	14
Others .....	22
Not known .....	
Total .....	485
Grand total .....	818

The figures in the following Table (VI) also do not include all the workers in the industry. They represent only those who reported the number of years they have been in the piano industry and the number of years they have lived in the United States. Among these, 429 are foreign born, 318 are Italians, 36 are Germans. The full racial distribution of these workers can be seen from the table:

TABLE VI.

NUMBER OF MALE EMPLOYEES REPORTING THE NUMBER OF YEARS THEY HAVE BEEN IN THE UNITED STATES, DISTRIBUTED ACCORDING TO NATIONALITY

NATIONALITY	NUMBER OF EMPLOYEES WHO HAVE BEEN IN THE UNITED STATES SPECIFIED NUMBER OF YEARS												Total
	Less than 1 yr.	1 yr.	2 yrs.	3 yrs.	4 yrs.	5 yrs.	6-9 yrs.	10-14 yrs.	15-19 yrs.	20-29 yrs.	30-39 yrs.	40 yrs. and over	
Italian.....	17	15	22	15	18	39	94	50	19	29	..	..	318
German.....	..	..	1	..	..	..	4	6	..	12	..	5	36
Hungarian.....	..	..	..	2	2	..	..	..	..	..	..	..	4
Bohemian.....	1	2	3	3	3	5	5	5	3	1	..	..	31
Scandinavian.....	..	..	..	..	..	..	..	..	1	1	2	..	4
Polish.....	..	..	..	..	..	1	..	..	..	..	..	..	1
Hebrew.....	2	..	..	..	..	..	1	2	1	..	..	..	6
Irish.....	..	..	..	..	..	..	1	1	..	3	1	1	7
Others.....	1	..	..	1	..	2	4	4	3	5	1	1	22
Total.....	21	17	26	21	23	47	109	68	27	51	12	7	429

Of the foreign born, 114, or approximately one-quarter of the workers, have been in the industry less than half the time that they have been in the United States; another quarter has been in the industry ever since they arrived here. It is, therefore, apparent that the newer immigrants are more and more finding employment in the piano factories. The manufacturers on the West Side have a particularly large proportion of Italians, because these factories, as a rule, turn out an inferior grade of pianos and can therefore employ cheaper and less skilled labor.

The race and nationality of the women we have not treated here, because the number employed is so small. They are employed only in the pneumatic action factories. Practically all the women employed are Irish or Irish-American, and live close to the factory.

#### PRINTING, BINDING AND PAPER GOODS.

The second largest group of workers in the district are those engaged in printing, binding, and the manufacture of paper goods. In the 25 establishments inspected, 2,245 workers are employed. Of these, 60 per cent are men; 39 per cent women, and 1 per cent children under 16. It leads as an employment for women, with 858, or 38 per cent of the total number of women workers.

Poor sanitary conditions in this industry cannot be charged to the existence of small, mean shops or to primitive buildings. The



number of small establishments is relatively few. There are only 10 places with a force under 25. They represent 106 workers, or but 4.7 per cent of the working force. Eight establishments employ more than 100 persons. Also, some of the most modern buildings in the district are those in which the printing establishments are found. Of the 25 firms, 17 are located in lofts, 6 in special factories, 1 in a converted tenement, and 1 in a dwelling.

The cleanliness of the work-rooms is rather above the local average. None of them fall into the "D" grade. Only 14 per cent of the employees work in dirty shops, and 86 per cent work in fairly clean or clean quarters.

Conditions in the water closets are reported as clean or fairly clean for 67 per cent of the men and 90 per cent of the women; as dirty for 33 per cent of the men and 10 per cent of the women. Of the men, 21 per cent have semi-dark water-closet apartments, and of the women, 6 per cent. Three per cent of the women have totally dark apartments. The provision of washing facilities is inadequate for 38 per cent of the workers. Cold water only for washing is supplied for 1,407 workers, or 63 per cent of them; hot water for 37 per cent; towels for 56 per cent.

The inadequacy of the washing facilities is serious on account of the handling of types and colors, and contact with poisonous lead oxides. While folding, binding, and collating are comparatively clean jobs, the putting on of gold leaf and handling of ink is at best a dirty job, covering the hands and smutting the faces of the workers. Only 59 women have lockers for their clothes, and but 316, or 36 per cent, have any sort of dressing room or washroom.

Of the 25 shops visited, 18 do printing, or printing and binding; 1 does binding only; 6 are miscellaneous. The most important in the miscellaneous group is a pattern-making company, the second largest establishment of the district. This place employs 407 persons, of whom 246 are women.

Although linotype and monotype machines have largely taken the place of hand composition, type-setting by hand is still used for the best grades of printing. We found 31 men operating machines and 188 hand compositors. Printers have improved in health and have suffered less from lead poisoning since the handling of type

and inhaling of dust from the cases have so largely been superseded by the newer processes. But there are still evils to remedy. Each linotype machine has a lead pot, which is heated by a Bunsen burner. The air of the room is vitiated by this burning gas and is very unwholesome to breathe all day long. The monotype machines, which give work to 11 men, are usually located in separate rooms, in order to keep the white vapors which rise from the melting pot from poisoning the air of the entire loft. The fumes are merely carried up a few feet towards the ceiling by a short exhaust pipe, instead of being completely drawn away into the outer air by means of continuous piping, hoods or exhausts. The danger in the monotype machines comes from the oxide of lead which forms on molten metal and is easily scattered about the workroom by currents of air. Seven shops where gas or lead fumes are found need better ventilation. There are difficulties in the press room, as well. A large number of pressmen and paper handlers are subjected to a high degree of heat and humidity, owing to the need for quick drying and smooth flow of the ink.

Proper daylight illumination is scarcely to be found in the printing trades. The extra strain on eyesight is particularly serious in an industry which in itself fatigues the eyes. Typographical work, in fact almost every process connected with the making of books, is a continual tax on the eyes. Typesetting, proof reading, engraving plates and several of the binding operations such as sewing, requires the workman to gaze intently at his work. For this reason the best system of illumination is none too good. In 16 establishments an actual count of employees working by artificial light in the daytime was made, as follows:

662 men, or 65 per cent of the men employed.

241 women, or 49 per cent of the women employed.

The best printing establishments have adapted the diffused system of lighting, which commends itself as most closely approximating daylight. Only about half of our workers use diffused or ceiling light, and the other half use the more trying individual or concentrated light approximately at eye-level. On press work the electric light bulbs are located below eye-level. The workers' eyes

are exposed to the unshaded light whenever the presses are being fed.

The employment of so large a number of women in the binderies makes it important to know to what extent their work requires standing. Of the women who are seated, scarcely any have chairs with backs, which would give relief by permitting relaxation when lulls occur in the work. The women at the binding machines or sewing machines, and those who fold would not find chair backs an interference with their work. Most of the women, however, are employed as collators or gatherers. They walk to and fro in the aisle between a double row of stacked "signatures" or sections of a book, usually 16, which they gather together in sequence, ready for binding. We find by actual count that of the 858 women employed in 25 establishments, 215 stand all day, that is, 25 per cent of all the women employees. In most places no stools are provided, and there is no alternation of occupation to relieve fatigue. Stools should be provided in all such occupations for occasional use. Our investigators noticed that the women sat on the corners of tables or on the window-ledges whenever an opportunity offered. No study has been made of these occupations to ascertain whether some modification of processes might not be devised to allow women to be seated. In this trade, as in all others later to be mentioned, in which women are required to stand, there is urgent need of better supervision.

#### METALS.

The metal trades have long been characteristic of the district. There are 82 establishments engaged in some branch of this industry. They employ 1,950 workers, or 4.4 per cent of the whole number of workers in corresponding branches of the industry in the city. Among the district industries, the combined metal trades rank third in importance, employing 18.2 per cent of the total number of factory workers.

Of the 1,950 workers, 104 are women. Only one child under sixteen was reported as employed. A single establishment — a sheet metal factory — gives work to 84 of the women. The re-

maining 20 are distributed among several small establishments, no one shop having more than three.

The metal trade is represented by the following groups:

	No. Estab.	No. Workers
1. Metal furniture, tools, etc.....	28	781
2. Sheet metal.....	6	406
3. Castings.....	5	140
4. Ornamental iron.....	15	168
5. Conveyances.....	28	455
Total.....	82	1,950

The metal workers are distributed among a great number of small shops. Half of the establishments employ not more than 10 men. Three-fourths employ not more than 25. Thirty per cent are employed in shops where the force is less than 25. Many of the smaller places are remnants of thriving businesses which have fallen off greatly during recent years. Shops which formerly built wagons now only do repair work; the majority engage in the assembling, grinding and polishing of metal parts; there is, on the whole, less foundry work than formerly, when building styles in the city made greater use of ornamental and architectural iron than is done at present.

The firms are housed in all sorts and conditions of buildings. Some of the trades are by nature partly out-door occupations. In a number of cases the establishments make use of a rear yard or court or an open driveway for storage of material, and part of the work is done in the open air. One scrap iron place occupies an open lot with surrounding sheds. This establishment was formerly a rolling mill, which discontinued as such a few years ago, and has since been occupied only in baling scrap iron for shipment to mills outside the city. This rolling mill was one of the last to give up business in Manhattan. Many of the establishments inspected represent a similar stage of industrial decline, — a fact which

largely accounts for their primitive quarters and poor sanitary conditions. Some of the buildings survive from a period when the West Side was but a village and door-yard space was plentiful. One manufactory of electrical goods occupies a two-story wooden structure which was formerly a dwelling. The front porch has been closed in with windows to make office space, and the walls which once separated the living rooms have been knocked out to form a loft.

As to kind of building occupied, the establishments are divided as follows: 50% in lofts, 42% in special factories, 3% in tenements, 3% in converted tenements, and 2% in dwellings.

The illumination of the metal shops is usually deficient. Artificial light is generally needed and used during daytime in some part of the shop. Much of the poor lighting is due to the fact that the same loft serves as both warehouse and workshop. Stores of raw material and finished goods are often disposed in such a way as to obstruct the light. Windows on three or four sides, or, at least, on opposite sides, are the rule. The small pocket-shop, with windows on one side, is unusual in the district. Defective lighting is seldom due to actual lack of window space, but a neighboring wall may render a row of windows ineffective, or the mere depth or breadth of the workroom, combined with a low ceiling, may result in a general dimness throughout.

In the wagon shops and iron works the lighting is especially bad. As a rule they occupy the ground floor; several are in cellars. The windows of the metal shops are often so dirty as to transmit very little light; forge dust and smoke hang in the air, making the atmosphere dingy as well as unhealthful. The men are so used to their dark, grimy quarters that they expect nothing better. A German wagon-maker even insisted that he preferred to work in the dark, saying he could "see" his work better.

Ventilation and temperature are both uneven in the metal works. Frequently open doors and windows are depended on for the former and the heat of the forge or furnace for the latter. There is little even distribution of fresh air, and workers moving about the shop are subject to sudden changes in temperature and strong drafts.

The character of the work is regarded as an excuse for dirt and disorder. The general cleanliness of the metal shops is of a low grade. The presence of heaps of metal and the accumulation of oxides and filings make it difficult to keep such places clean. Many of the establishments are small shops, which are especially liable to neglect in this respect.

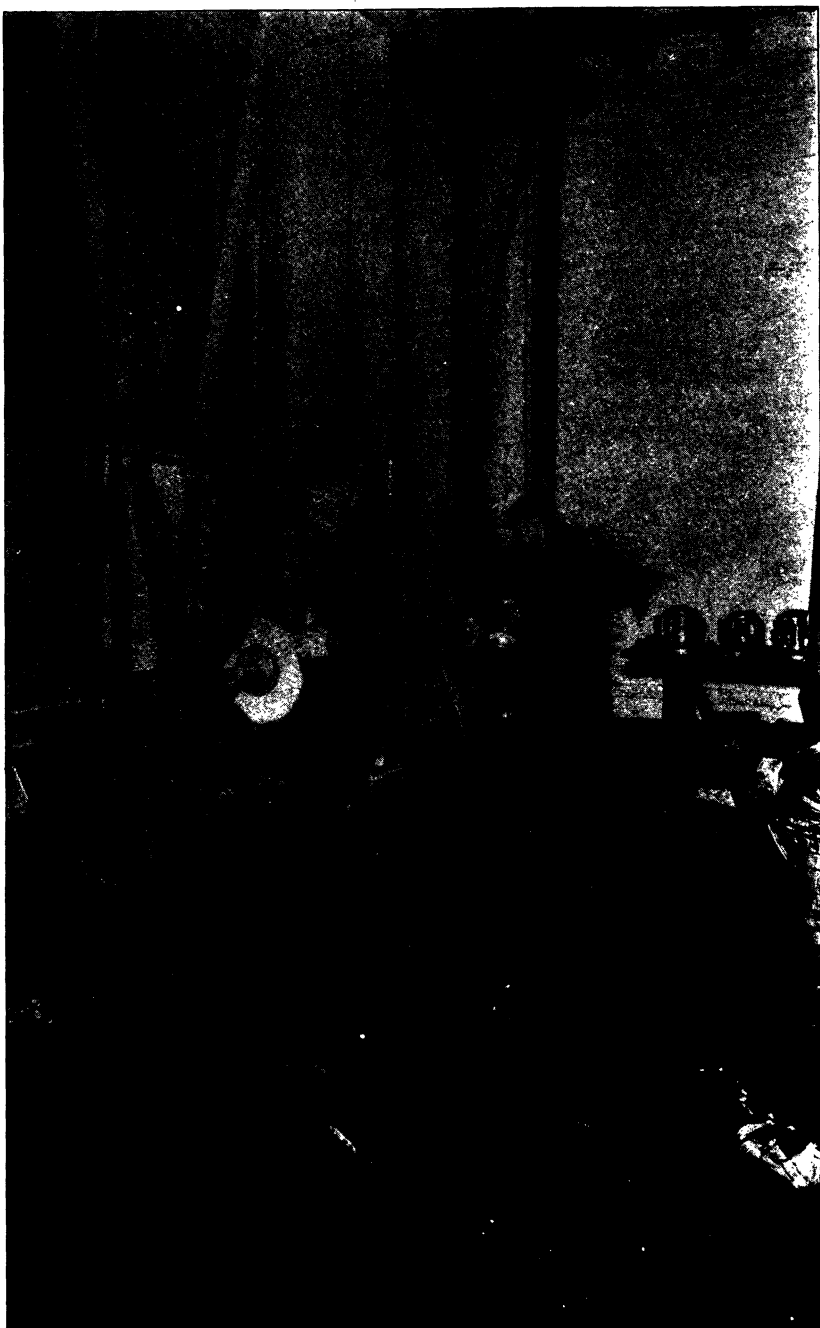
Only 32% of all the metal workers are employed in clean or fairly clean workrooms. Over half, or 53%, work in dirty workrooms, and 15% in very dirty workrooms. These conditions are all the more serious in the absence of any provision for lunch-rooms. The workshop is used for this purpose, the dust-covered machines or benches serving as tables, so that the possibility of taking in toxic particles with the food is always present. In one shop the men were observed eating their lunch in the midst of suffocating acid and lacquer fumes.

These dangers are increased by the poverty of washing facilities. It is unusual for the men to have adequate arrangements for washing up. In no case is a separate washroom provided. As to washing facilities, 1% of the workers are reported as having none at all; 80% as having cold water only provided, and 19% as having hot water; and 53% as having no towels. Measuring the shops by our standards, which are rather low than high, it was found that 766 metal workers, or 39.3%, had adequate washing facilities, and 1,182, or 60.7%, inadequate.

Many of the buildings are old structures, in which the water closet apartments are additions. Usually these apartments are dark, ill-ventilated and dirty. Often they were found to be absolutely dark, so that the inspector had to light a match to observe their condition. The closet of one small shop was located in the cellar. The entrance was a drop door, flush with the court level, which, when lifted, disclosed dark, winding stairs. The cellar floor was of dirt, uncemented, and the wood in the floor of the closet broken through. Rubbish littered the floor, the stool was broken, and the boards were soggy and evil-smelling. This place was the worst found among the metal shops, but the average of cleanliness, light and ventilation generally was low.

The condition of the water-closets for men is extremely bad. Of the men, 1,473, or 80%, are subjected to conditions which are





No. 3.—POLISHING AND BUFFING ROOM. The blower system has been out of order for a month or more, and the brass dust and fluff cover the machinery, floors, and windows. It is doubtful whether the blower system is adequate when in use.







either dirty, or very dirty; 366 men, or 20%, to conditions that are clean or fairly clean. While the workers themselves are largely responsible for the shocking uncleanness which prevails, the darkness of the water-closet apartments and the failure to clean up are the chief reasons for their evil state. In regard to illumination, 39 per cent of workers are supplied with water-closet apartments which are either dark, or semi-dark. For 38% the closets are poorly ventilated. Comparatively few instances of neglected plumbing were found. One establishment provides only three water closets for 137 workmen, while, according to recognized standards, one water closet should be supplied for every 25 persons.

The accommodations for the 104 females engaged in this trade are slightly better as regards cleanliness, light and ventilation. Thirty per cent of them are affected by fairly clean, and 70% by dirty conditions. Sixty per cent of them have fairly ventilated apartments and 95% have well-lighted ones.

With reference to location, 181 water closets are located in the workrooms, 9 in the hall, 2 in the yard, and 2 in the cellar. Of those opening directly into the workrooms, 26% have no outside windows.

A large sheet-metal factory provides a dressing room for its 84 women employees. Three automobile concerns also have dressing rooms for their women workers, who number but 14 in all. This makes 98 women, or 94% of the total number, who have dressing room accommodations. But in no case are lockers for clothes provided, — an especial need in these uncleanly trades.

The firms inspected are engaged in one or more of the following groups of processes: foundry work, tool and machine work, polishing and buffing, plating, lacquering and soldering.

The question of special ventilation in connection with all of these processes is a very important one, as the removal of gases and fumes from the brass and iron foundries is imperative if the health of the workers is to be preserved. Similarly, the irritating metal dust, lint and rouge, or red oxide of iron, that fill the air from buffing and polishing, should not be permitted, especially as an adequate remedy for this evil has been found in the installation of a good blower system. The control of the lacquer fumes, the acid fumes from the plating, and the lead fumes from soldering is also

possible and should be required. One of the largest concerns in the district maintains a boiling potash vat without a hood. Another firm, working in brass, uses a drying box within the work-room, with no outside vents. The lacquer fumes from this process pervade two lofts. These are instances of neglect to employ simple and obvious remedies, and are typical of the general carelessness existing with respect to sanitary conditions.

The tin-can factory is the largest establishment in the industry—in fact, it is one of the most important in the district, as well, being sixth in numbers and employing 227 men and 84 women.

It illustrates practically all the poor conditions of work above described. The premises are old and dingy. They consist of three buildings, formerly separate, now thrown into one large factory. They are all old buildings, of brick and wood construction. The mezzanine floor is particularly ill adapted for a packing room. The ceiling is but  $6\frac{1}{2}$  feet high, and heavy beams project almost a foot lower, so that the workers can not walk through the room without bending their heads at every beam. As to cleanliness, the whole factory is marked "C" grade, that is to say, it is dirty and in need of repainting.

Tin cans of every sort are made, the process varying according to the size and shape. Some are made by cutting the tin, bending it into shape and soldering; others are stamped out by die presses. Both men and women handle the tin in some stage of manufacture, but only a few wear gloves to protect their hands from the rough edges of the metal. Cuts from the tin and burns from the spattering of acid used to clean the metal are not infrequent.

Men and women operate the die presses to stamp out covers, handles, spouts and seamless cans. Besides enduring the constant noise and heavy jarring of the press, they are subjected to unnecessary eye strain from the unshaded lights placed just behind the die plate, directly in line with their vision. These lights could easily be shielded. Some of the presses are admirably guarded to prevent the crushing of hands and fingers. But a number of the guards can be removed at will by the workers, so that the protection can not be regarded as complete and effective. There are elements of danger in the soldering processes from both heat and fumes. The special ventilation of the soldering machines is far from satisfac-



NO. 4.—SHELL CUTTING MACHINE. The air is full of the shell dust, which covers the floors and machines. There are no exhausts to carry off the dust.  
The men eat their lunch in this work room. The washing facilities are entirely inadequate.



tory. The men are frequently shifted from department to department in order to avoid constant exposure to the vitiated air.

A large number of the women stand all day. Their work at the die presses, at the threading machines, in assembling parts, etc., is speeded up to the limit of endurance.

### FURS, ETC.

Nine establishments are engaged in making fur, leather, rubber and pearl goods. The number of workers employed is 626, of whom 76% are men and 24% women.

We found 75% of the men and 69% of the women working in fairly clean shops; 25% of the men and 31% of the women, in dirty or very dirty ones.

Illumination in the water closets is rated as dark or semi-dark for 25% of the men. On the other hand, the women's accommodations are all reported as well lighted. Ventilation is poor for 15% of the men and 17% of the women. Conditions are reported as dirty for 62% of the men and 50% of the women. One firm has a water closet in use by both sexes.

Washing facilities are especially poor. They are inadequate for 86% of the workers. Hot water is not supplied in any of these factories, and towels are provided for but 17% of the workers.

One of the largest establishments in this group is a factory which manufactures buttons of mother of pearl. The shop occupies the fifth floor lofts of two buildings, front and rear. There are plenty of windows, but many partitions interfere seriously with both light and ventilation. Each loft is divided into five or six rooms. Artificial light is needed much of the time. Unprotected gas jets are the only illumination.

The main room has rows of machines close together for cutting, planing, drilling and polishing the shell. There are two other rooms where polishing goes on, in one of which hand-turning is done. This process consists in cutting the patterns into the buttons with a chisel, while they are held in a revolving matrix. There is also a drilling room, a small room where the buttons are sorted by colors, two carding rooms, where the buttons are attached to cards, and a small packing and shipping room.

In one department, known as the Novelty Room, fancy articles are made. The edges of the shells are first cut off to make them even. Then they are sawed into square or oblong sections of the desired size. If a paper knife, for instance, is then to be made, the outline is drawn with a pencil, and the paper knife is then "shaped up" by means of an emery wheel. This process creates more dust than any other in the shop.

The chief danger in this establishment is one common to the industry as a whole — from the shell dust which fills the air and piles up everywhere on the machines and the floor. The dust covers even the windows. A few of the machines in the Novelty Room have hoods and exhaust pipes, with a vacuum fan draught, but these are hopelessly inadequate. Most of the machines have no exhaust at all. Perhaps half a dozen have pasteboard hoods tied on with string to protect the workers' eyes from the flying dust. Only men work in this room, but about 20 women operate drilling machines in other rooms where the dust is very bad.

Although the inspector stayed in this shop only an hour and a half, the result of the visit was extreme hoarseness and sore throat.

In the Novelty Room (the only place where there are hoods or exhausts) the air is so heavy as to seem almost suffocating. Ten hours a day of work in this atmosphere can not fail to be injurious. In fact, Dr. Charles D. Graham-Rogers recently testified before the State Factory Investigating Commission that in pearl button factories the particles of shell fly into the eyes of employees or are inhaled by them. The silica invades the lungs and cuts the mucous membrane of the nose and throat, causing catarrh and sometimes tuberculosis. "Every pearl button worker I examined," he said, "was found suffering from bronchitis and laryngitis."

The ventilation of the entire shop is very poor. Only a thorough ventilating system, as well as powerful dust exhausts, could relieve the situation, for the air is not only filled with dust but is also heavy with the organic odor peculiar to the material used. The main work room, moreover, is greatly overcrowded.

A few of the saws in the Novelty Room are not properly guarded. Some of the emery wheels used for polishing rub the hands of the men who operate them, so that they are forced to wrap their fingers with rags to keep them from "burning." All the ma-





No. 5.—BUTTON POLISHING. The exhausts to carry off the heavy shell dust are inadequate. The air is thick with dust which has an irritating effect upon the throat. Note the unprotected gas jet burning at full force scarcely a foot from the worker's eye.





chines are excessively noisy, and in the cutting and grinding rooms the din is terrific.

The lighting is defective. In the carding rooms there is a gas jet at only one end of a long sewing table, so that the girls at the other end are subject to constant eye-strain, except during the middle of the day when no artificial light is needed. The gas jets which are used for lighting the cutting and drilling machines are on a level with the eyes of the workers, entirely unprotected, and often less than a foot in front of the face.

The washing facilities are extremely inadequate. There are two small sinks for about 150 workers. There is no hot water. Towels are supplied for only about 25 carders, who for the sake of the cards "must be careful of their hands." This is particularly bad, because practically all the workers eat their lunch in the work-rooms, at machines that are thick with dust, and with hands that are covered with it.

The building is a veritable fire trap. It has wooden floors and stairs, narrow halls, many partitions and doors, and badly blocked fire escapes. The main room where about 80 people work has no fire escapes directly connected with it, and the way to the two on the rear of the building lies through crowded work-rooms. The fire escapes themselves are of the old straight ladder type.

One of the largest and most important establishments in the district is a hatters' fur cutting shop, employing 365 hands. It prepares fur for felt hat manufacturers, that is, it performs the initial processes in the making of hats. The shop is located in a new building and is rated high for sanitation, fire protection, etc., but the nature of the processes call for careful consideration, as there are two distinct elements of danger to the workers: (1) The flying fluff, particles of fur, and loose hair which are inhaled into the workers' lungs. (2) Contact with mercury salts used in the "carotting" process and the possible mercury poisoning resulting therefrom.

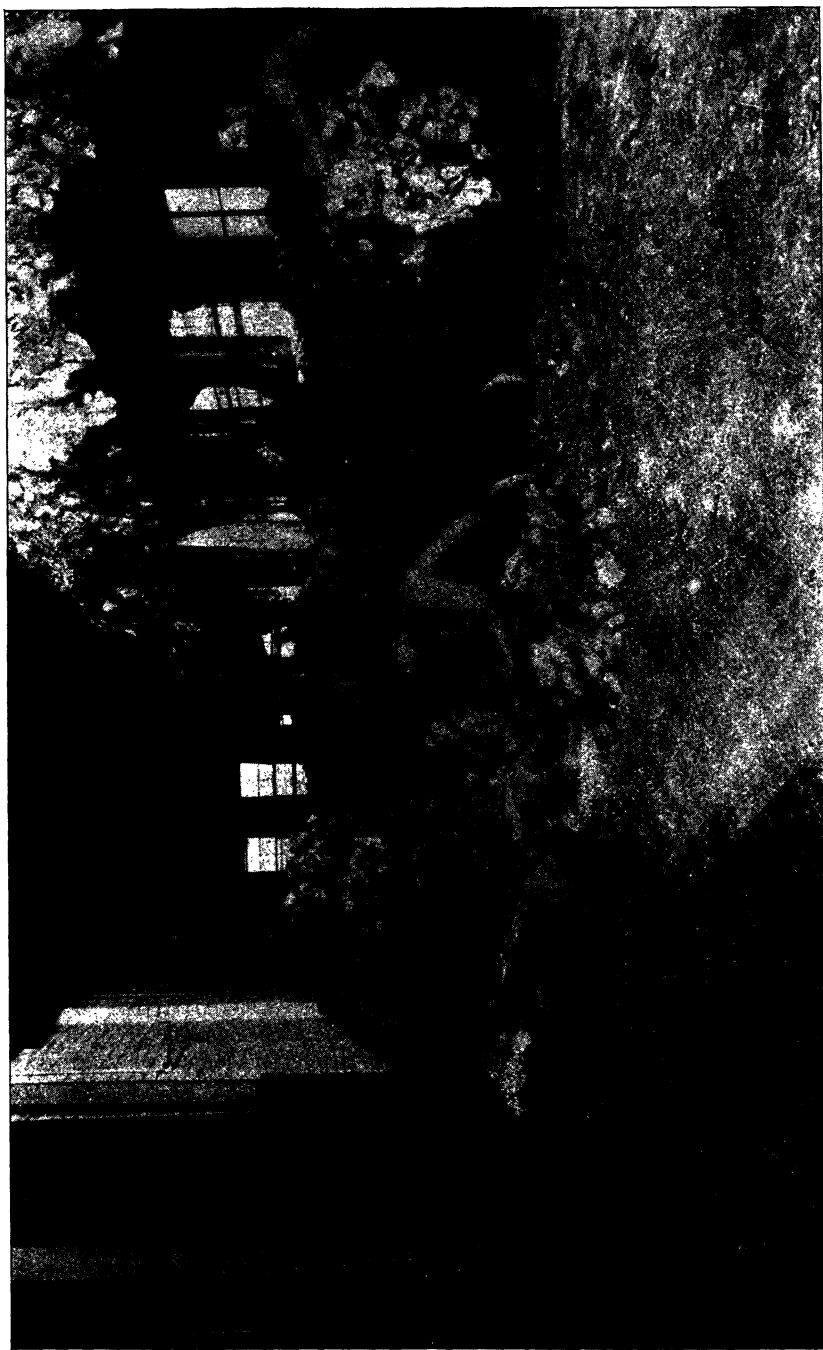
The skins of Russian and Austrian hares and Australian rabbits are imported by the manufacturers and worked up into a high-grade product. The skins are first scraped and trimmed by a large force of Italian and Greek men. They work with curries

and knives and liberate a large quantity of dust, hair and fluff from the skins which floats in the air and settles on tables, window ledges, floors—in fact, it seems to permeate the whole atmosphere. The employers have tried to guard against this condition. The work room is large and well lighted, and the plenum ventilator system supplies fresh air. Unfortunately, however, the introduction of the air serves to keep the floating particles in constant agitation. They are further stirred by currents of air whenever the windows are open. These well meant and costly efforts to improve conditions are therefore not effective. The workers must unavoidably inhale the floating particles of fur, and thereby become predisposed to troubles of the throat and lungs—trade diseases which have long since been recognized both here and in Europe as characteristic of the furriers.

In the clipping room, the next in order, this danger has been recognized and more effectively guarded against. The hair is cut to a uniform length by a rotary knife machine. Each machine is practically closed in and so completely connected with an exhaust pipe that the loose hair is drawn away as soon as the blade of the knife severs it from the pelt. The arrangement is so perfect that very little hair or fur finds its way into the workroom. The chief danger to the worker is due to his carelessness in moving the knife guards out of place. His fingers are consequently in danger of being cut as he presses the pelt against the swiftly revolving blades. These guards were attached to the machines a few years ago, at considerable expense. As often happens, the foreman does not enforce their constant use in face of the opposition of the men, who wantonly disregard their own safety for the sake of greater speed.

Following the clipping of the long hairs, the pelts are subjected to chemical treatment, or “carotting,” which washes out the animal oil from the fur and makes it “mat” or “felt” more easily. It is here that the chief element of danger is found; an 11½ per cent solution of mercury nitrate is used. It is evident that care and forethought have been given to the arrangements. The “Acid Room” is admirably equipped. The floor is asphalt, the tables are supported on brick piers, and drain towards the center. The whole place is washed down every Saturday. There are skylights





6.—CLEANING ROOM. The pelts are scraped and trimmed by a force of Italians and Greeks. Note the hair and fluff upon the floor. The air is full of flying particles. A plenum ventilator agitates the air without removing the flying particles.





overhead which are open in summer. The room is evidently kept as cool as possible, in order to minimize the danger due to the volatilizing of the mercury solution which occurs at ordinary room temperature. About 50 men are employed who stand at their work and wear rubber gloves, which are provided by the firm. The process consists of brushing the solution on the skins with a stiff brush.

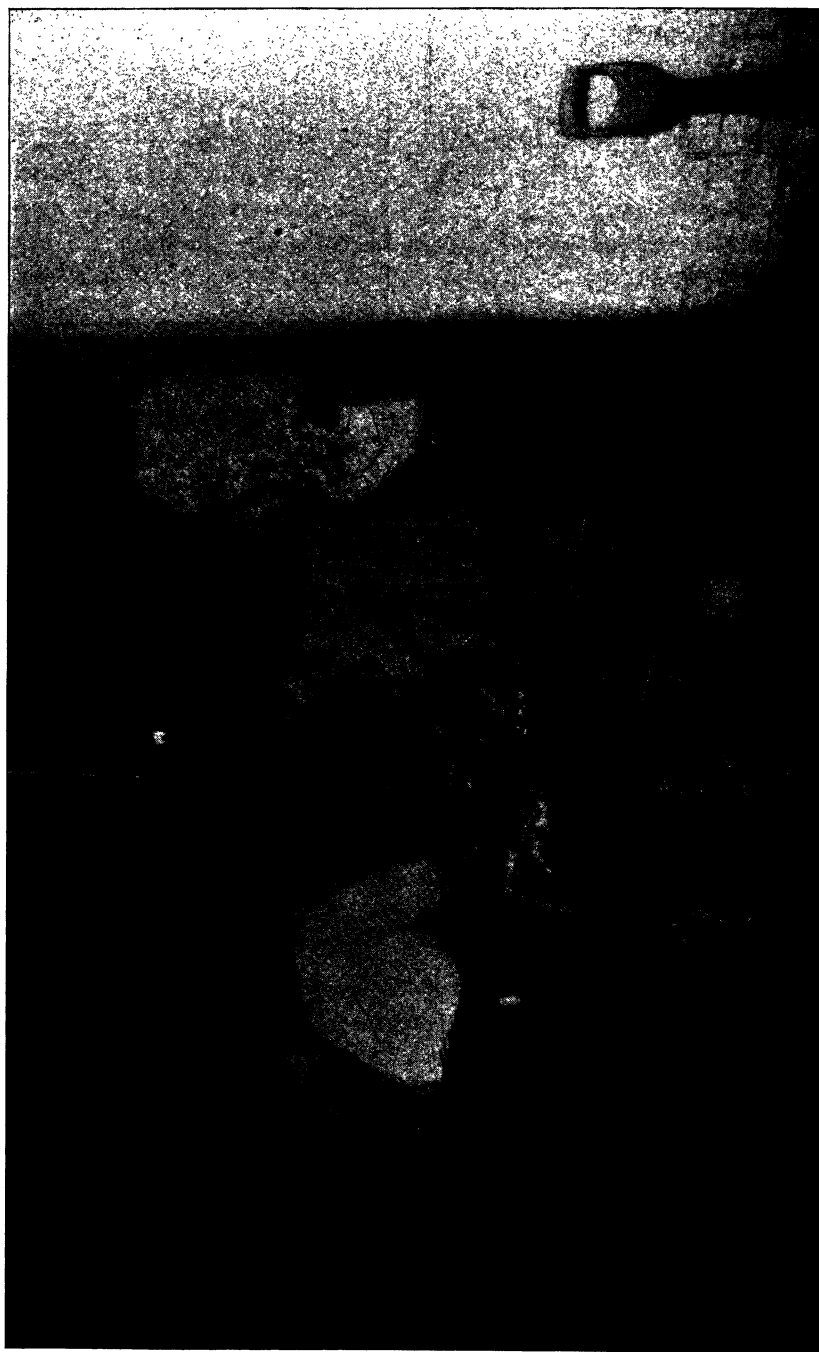
The foreman refused to admit there was any ill-health among the men; in fact, he pointed out individuals who had worked in the Acid Room for a period of years; some of them having been there six or seven years. The men are all foreigners, and could not be interviewed apart. The statements of the foreman can not be regarded as conclusive evidence that there are no cases of poisoning known, for mercury is a slow-working poison; it may take years to accumulate in the system before it produces acute symptoms, such as "shakes," that is, partial paralysis. Often the men do not recognize the earlier symptoms themselves, or refuse to speak of them, as they do not wish to lose their jobs. Unless they are sick enough to need medical treatment, it is therefore well-nigh impossible to locate cases of poisoning. We were unable to follow up this investigation intensively, and to trace possible clues that might have led us to the discovery of individual cases.

To continue our description of the processes: After the acid treatment comes the drying of the skins. They are spread on trays and run into the drying ovens. Whether wet or dry, the skins now carry the mercury salts and may cast their injurious influence on the men who handle them. After the drying they proceed to the brushing room. The greatest care is exercised to exclude the brushings (nitrates, hair, etc.) from the work room by a system of exhausts, for, as the foreman ingenuously remarked, "If they weren't carried off, your mouth and nose would soon be bleeding." Such, it is true, is the effect of the sharp nitrate-laden particles or fibres. Being brushed free from dust, the pelts are finally ready for cutting. A high speed rotary knife machine removes the skin and leaves the fur lying in one piece. This fur placed on metal sheets now reaches the women, some 80 or 100 sitting at tables. They sort the fur and pick out bits of

skin, imperfections, etc., and pack the loose fur in paper bags, finally ready to be sent to the hat makers.

Authorities do not agree as to whether the wet or dry processes are more conducive to poisoning, but there is little doubt that insidious dangers menace the workers in this industry. Even under the best conditions, all the elements of danger are not eliminated. Admirable as this shop is in many ways, there are a few additional safeguards for the workmen which may be suggested. Every recognition should be given to the sincere effort of the owners to make conditions of work as wholesome as possible. They do not, however, observe one precaution which is strictly required in the English Factory Act, namely, that they should make known to the workers the dangers of the trade and warn them to take every precaution to avoid contact with the mercury solution and the mercury salts. Instead of a policy of concealment, notices printed in the languages of the workers ought to be posted in the work rooms. The need for some such warning was particularly evident in the acid room. The pelts after treatment are stacked in large piles and immediately carried to the drying room. One of the photographs taken in the course of this investigation shows a man carrying such a pile of furs on his shoulder with the wet pelts actually touching his face. As both inhalation of the vapors and contact with the lips may introduce the poison into the system, it is abundantly evident that the method of transferring the pelts should be radically changed. As has already been said, the workers are supplied with rubber gloves, but they should also be given rubber aprons. They should be warned that the salts may be absorbed through the skin, and discouraged from spattering the solution upon themselves and the workmen who stand nearest them. It may be impossible to devise any system of ventilation to remove the mercury fumes when "carotting" is done by hand, but there is no doubt that the greatest care should be exercised throughout this process.

Moreover, washing facilities should be readily accessible and adequate. In this shop neither hot water, soap, nor towels are supplied, so that improvements are to be recommended in this particular too. Toilet facilities are supplied on all the floors, but the wash room for all employees is located on the first floor. This



—“CAROTING” ROOM. The skins or pelts are here brushed with mercuric nitrate. The men carry the piles of wet pelts down to the dry room on the floor below. Note the wet pelts touching the man's face.







is not a fortunate arrangement. The wash room, it is true, is easily accessible to the men in the "carotting" and drying rooms. But it hardly seems likely that men and women at work upon the skins and fur in the upper stories of the building will walk downstairs to wash their hands before eating lunch. No lunch room is provided, and although the majority of the workers may live nearby and go home for their noon day meal, yet many remain in the shop and should have a place kept apart for meals. This is equally true of other departments, especially in the brushing and cutting rooms where no food should be kept or eaten on account of the mercury salts. It is also true of the scraping and cleaning department where the flying fluff and the odor of the skins renders the rooms unfit to be used at luncheon time.

On the whole, therefore, this shop illustrates the need of continued careful study of factory hygiene, besides proving that such matters can not safely be left to the care even of employers who are far above the average in their desire to do well by their employees.

#### WOOD MANUFACTURES.

Like the metal trades and the textile trades, the wood-working industry may be said to be indigenous to the district studied. Under this head are considered all wood-working shops except those engaged in the manufacture of pianos. It includes a large number of small places. The 610 workers are divided among 42 establishments, and 45 per cent of the employees are engaged in shops which employ a force of less than 25 persons. The largest firm has 77 workers.

The establishments are housed in 14 special factories, 17 loft buildings, 2 tenements, 1 converted tenement, 2 dwellings, and 1 converted dwelling.

Of the workers, 65 per cent are engaged in fairly clean shops and 35 per cent in dirty or very dirty.

A low grade of cleanliness is found in the water closet apartments. Twenty-three per cent of the workers are affected by fair, 77 per cent by dirty, or very dirty, conditions. Accommodations for the men are poor, 56 per cent having toilets badly lighted and ventilated. Fourteen per cent of the water closet apartments ven-

tilate into the work-rooms, from which they are separated by dwarf partitions only. Forty-nine per cent of them have no outside windows. One shop violates the standard set that there must be at least 1 water closet to 25 persons.

Inadequate washing facilities are reported for 67 per cent of the employees. Hot water is supplied for 17 per cent and towels for 35 per cent.

The fumes arising from the use of turpentine in the finishing processes of this trade are extremely unhealthful. As this danger has been already described in connection with the piano trade, no further discussion will be given here.

In the wood-working shops, machinery as a rule was found without guards or safety appliances. Unprotected saws and belting were noted in the great majority of the shops. Only one circular saw was found which was self-feeding and amply protected.

Less than half the shops had installed the blower-system for removing saw dust, and the majority of these were not really efficient. One factory making shoe lasts has blowers at all the machines, but saw dust and chips fly in the air. The dust in this factory, being made from hard wood, is particularly harmful. One man works constantly in the small room where the dust from the blowers is emptied into bags. Although the air of the chamber is thick, this man wears no respirator. He depends on chewing tobacco to keep his throat moist.

#### LAUNDRIES.

The laundry industry ranks sixth in the total number of workers employed, and is the second largest employer of women. The only trade employing a greater number of women is that of printing. Since 77.4 per cent of the workers in laundries are females, it may be said that this trade is still a woman's job.

All motor or steam laundries, that is — laundries which use power-driven machines for washing, starching, or ironing — were visited. There are 14 of these establishments, representing a large proportion of the motor laundries in New York City. According to the Federal Laundry Report of 1911, "20 motor power laundries may be said to do practically the bulk of the washing in New York City. The largest number of women employed in one laundry was 200, in several others the number reached 150,

and elsewhere it ranged from 9 to 50.”<sup>1</sup> The largest establishment inspected usually employs 177, but during the summer rush has as many as 225 workers. Three employ more than 75 workers, and the smallest establishment has 7 workers.

Practically every branch and grade of laundry work is represented. One of the largest establishments does Pullman car, steamship, hotel and restaurant work. Two are waiters' and barbers' supply laundries. One does rough dry work for the small hand-laundry trade, and one specializes in flat work. Still another launders shirts and collars for high-class custom shirt-makers who have shops along Fifth Avenue. Five of the total 14 cater to family trade.

Only a few of the buildings in which the laundries are housed are modern in construction. There are none less than five nor more than twenty years old. Only two were designed for laundry purposes. The others have been remodelled very slightly or radically in accordance with the desire of the occupant. For instance, one excellent plant occupies a building originally intended for a bakery but now well adapted for a laundry. Another is housed on the ground floor of an old stable, very slightly remodeled and still a miserable place. In other words, one finds every type from a model two-story plant having light on all sides, movable skylights, high, metal-covered ceilings, lunch room, a filter tank, ventilating system with exhaust fans, hoods and pipes, down the scale to a converted tenement or old, unsuitable factory building. There are in all 3 special factories, 9 loft buildings, 1 tenement house, and 1 dwelling house used for laundries.

All the establishments have windows to the outer air on at least two sides, most of them have windows on more exposures. This arrangement secures cross ventilation — an indispensable feature in connection with the heat-producing processes of the laundries. Although adequate window space is the rule, artificial light is needed and used in ten buildings — a condition to be accounted for in part by the location of the laundries in basements or lower floors, and the obstruction of daylight by machinery, drying chambers, shelves and bins.

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<sup>1</sup> Woman and Child Wage Earners in the United States. Vol. XII. Employment of Women in Laundries — p. 13.

On the whole, the general cleanliness of the 14 laundries is fair, a circumstance not especially due to the good management of employers, but rather to the nature of the industry which allows no accumulation of rubbish or dirt. Neglect is more often found in the washroom which is not kept properly dry. Seventy-six per cent of the force work in clean or fairly clean workrooms, 24 per cent in dirty workrooms.

The toilets are, on the whole, above the average found in other industries. In two instances, they are located in the yards, but in the other establishments, they are separated from the workrooms by full-height, wooden partitions. "A" grade conditions prevail for 2 per cent of the men and 43 per cent of the women; "B" grade, for 71 per cent of the men and 40 per cent of the women. Twenty-seven per cent of the males and 17 per cent of the females are affected by dirty or very dirty conditions.

Accommodations for the men are inferior to those for the women. Fifty-seven per cent of the males and 72 per cent of the females have adequately lighted toilets; 16 per cent of the males and no females are affected by dark toilets. Twenty-eight per cent of the males and 20 per cent of the females are subjected to poorly ventilated toilets. In one laundry the flush cisterns were broken and their action impaired. Two establishments violated the standard set that there must be at least one water closet to 25 workers.

It seems an irony of circumstance that 46 per cent of laundry workers have inadequate washing facilities. Fifty-four per cent are provided for adequately. Cold water is supplied for 57 per cent, hot and cold to 43 per cent. Towels were furnished to 84 per cent of the employees; there was none or an inadequate supply for 16 per cent. "They can use anything they find about," one employer took the trouble to explain.

Since this industry is one of the largest employers of women, the provision of dressing rooms is important. Laundry workers, more than any other set of employees, change their clothes on entering the factory. Many take off their shoes — both for comfort and from motives of economy. Of the 14 establishments only 10 have dressing rooms for women. These have been improvised at little expense, in one case simply by curtaining off the space under





No. 8.—LAUNDRY. This mangle is effectively covered by a hood; the steam and heat are carried off by suction. There are ten such mangles on this floor and yet the temperature is comfortable and the humidity low. The feeders stand constantly, but the catchers alternate in sitting.





the stairs. For the most part they are separated from the workrooms by dwarf partitions of rough wood. Very few have windows to the outer air. Shelves, hooks, and an occasional chair are the furnishings. One place supplies sanitary lockers. Four factories have no dressing rooms. In one large laundry a few nails have been driven into the walls of the toilets and are supposed to afford dressing-room facilities. Clothes were found hanging up on the hooks and shoes were standing outside the doors. Expressed in numbers, 81 per cent of the women have dressing-room facilities, and 19 per cent are without any. The situation, therefore, is most unsatisfactory. If at all intended for rest or emergency purposes, these rooms are hopelessly inadequate. They afford little, if any, privacy or comfort.

The importance of pure drinking water cannot be over-estimated. Excessive heat and steam of the workrooms and strenuous muscular exertion create abnormal thirst and lead to an increase in beer drinking if cold water cannot be obtained. Complaint was made to the inspector in one laundry that the water was so bad it could not be drunk. One employer has filtered water and provides ice in the summer time. Two insist upon individual drinking cups, another provides a bubbling fountain on each floor.

One plant has a lunch room for women. Gas stoves for warming lunches, etc., were found in a few instances.

In considering the sanitary condition of laundries a description of some of the equipment and processes is essential, as they directly affect the health and comfort of the workers. The preliminary processes of listing, marking and sorting are in the majority of cases performed by women. The work of handling the soiled garments is dirty and unpleasant and involves the possibility of contagion.

The washrooms call for especial notice since, under the most favorable sanitary conditions found, they are not healthful places for work. Wetness under foot, heat, steam and vapor or heightened atmospheric humidity are always present, although in varying degrees. To be sure, good drainage, effective ventilation, and proper provision for escaping steam ameliorate these conditions, but they do not remove them entirely. It is particularly import-

ant that the washrooms should be completely separated from other departments in order that other workers may not unnecessarily be subjected to these hardships. Only 5 washrooms are wholly separate from other departments. One of the worst is located in a basement together with the engines and boilers. The best washroom was found on the top floor of a factory — an ideal location since neither heat nor vapor travel downward. In another building complaint was made by a sign painter that steam came into his shop through the floor and that the heat in the summer time was unbearable.

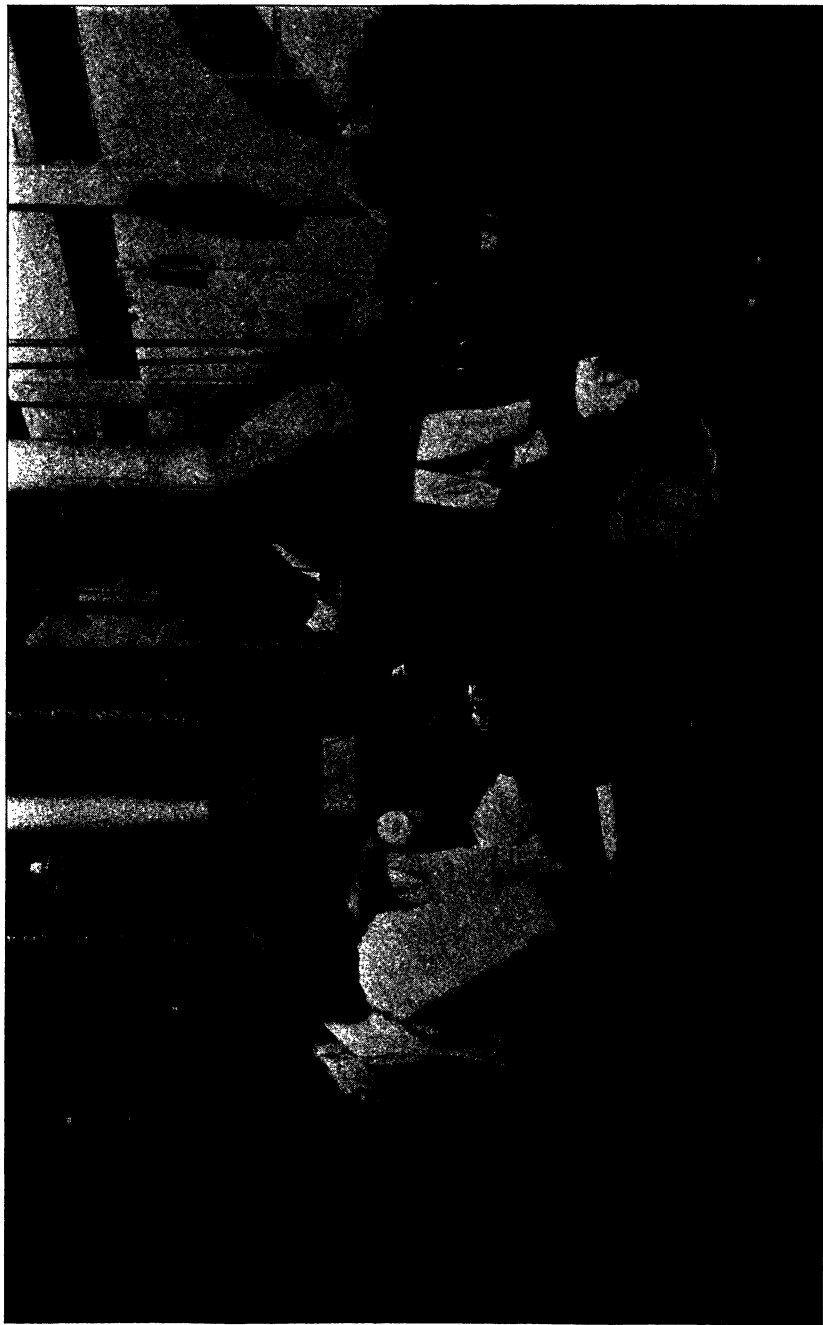
All of the washroom floors are made of concrete raised six inches or a foot above the general flooring. In regard to the drainage, there is the greatest diversity of construction and equipment. In 7 washrooms drainage is good; the floors slope toward the gutters and in some instances each machine and extractor has its individual drain. Yet even here dampness and occasional pools of waste water are found under foot. Six have flat or sunken floors with streams of water escaping from the washing machines. One has a badly cracked and broken floor upon which pools of water remain until swept away with a broom into the drain. The floors in half the washrooms seen were wet.

Wooden shoes are worn by the men in some of the better establishments. A number who wore heavy leather shoes complained that the wooden ones hurt their feet. In the very worst establishments the washers took no precaution whatever to keep their feet dry.

The importance of ventilation in this department can not be overrated. Heat and humidity may not be as keenly felt in winter as in summer, yet the risk to the workers' health is as great during the cold weather on account of exposure to low temperatures on leaving the laundry. Mechanical devices or systems of ventilation are necessary for the control of humidity and temperature. Yet nine of the washrooms depend solely upon windows for ventilation. In four of the washrooms there are exhaust fans placed in the windows. Some of the rooms are small and low-ceiled. These rooms are described as veritable infernos in summer by employees who have worked the year round in them.

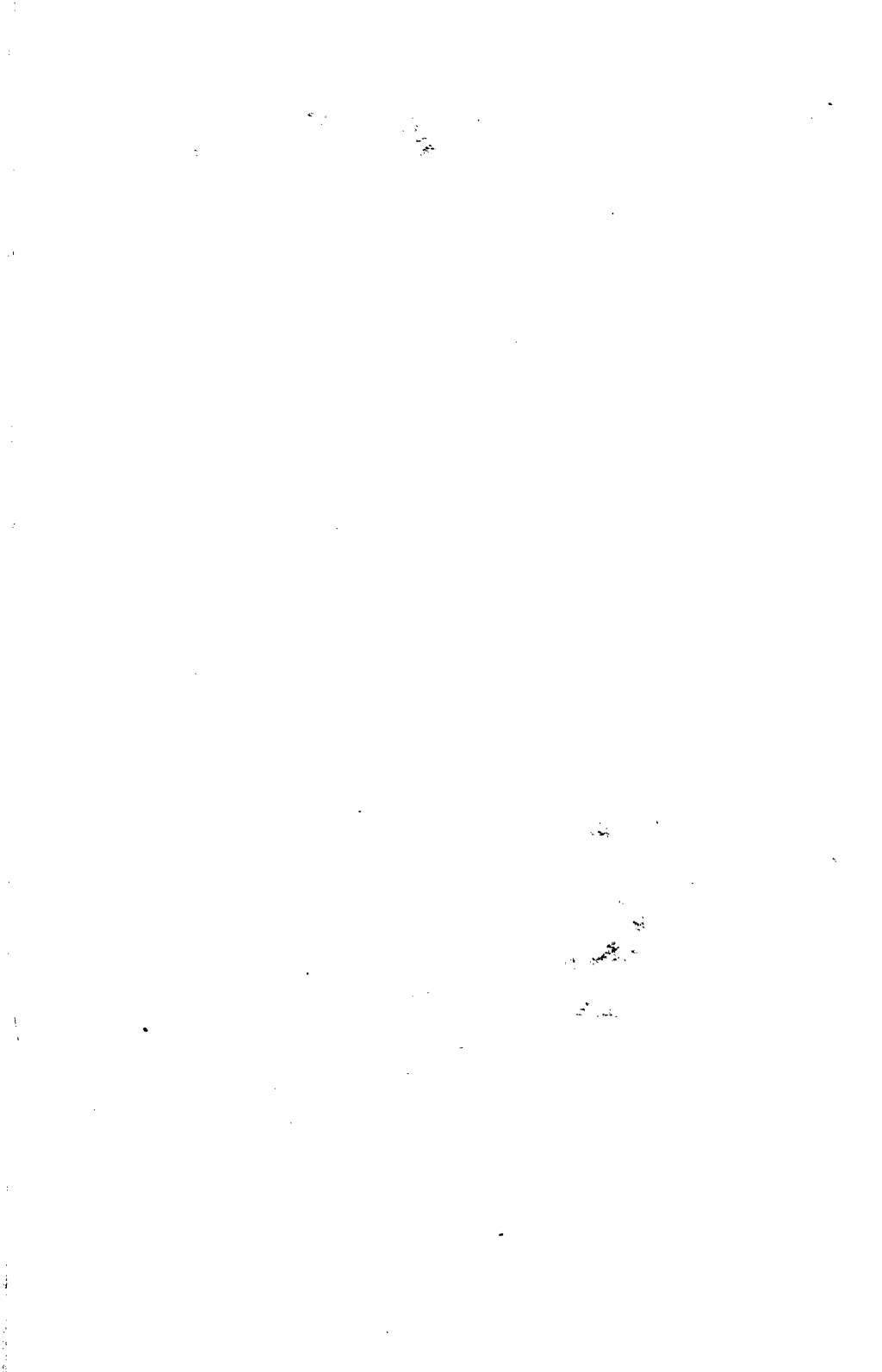






No. 9.— LAUNDRY. Body ironers covered by hoods which carry off by suction the vitiated air and heat from the gas burners. The hoods also guard the operators from burns, for they cover more than half of the hot rolls. One operator made 63 foot motions a minute; another 81. One girl worked in stocking feet; another in bedroom slippers. The work is hard on the feet, and the manager said that in warm weather practically all the women take off their shoes.





In two plants where the machinery is modern, well maintained, and tended by skillful men, little waste water is poured on the floor, and practically no escape of steam occurs. In 12 washrooms inadequate provision or none at all is made for escaping steam. Clouds of vapor were noted in some places so thick as to obscure the features of the men.

The washers are compelled to handle heavy bundles of clothes. One of the demands of the recent laundry strike was that no worker be required to handle a bundle of clothes weighing over 25 pounds when dry. At present there is rarely any attempt to regulate this weight, and prevent injury to the men from lifting bags of clothes which saturation with water has rendered dangerously heavy.

At least 75 per cent of the workers are employed on the mangle floor. Hence, the sanitary and hygienic provisions on this floor are of the utmost importance. In this room the women stand all day to shake out the wet clothes. Here also are the girls who tend the mangles, which constantly send up heat and clouds of steam. Exhaust hoods are practically indispensable if temperature and humidity are to be regulated. Yet only one plant has an equipment of mangle hoods, with an exhaust to draw off the steam as it rises directly from the machine. In this room, 125 women are working. In another plant, skylights or exhaust fans are fairly effective. Even here temperature varies from 70 to 75 degrees in winter. Exhaust fans are installed in three other mangle rooms, but they are ineffective and scatter the rising steam and do not successfully remove the moisture and heat. In nine of the laundries no provision is made for mechanical ventilation. Drying chambers in some places aggravate conditions. Only one plant equips its dryers with suction hoods. In one mangle room there is a constant draft from large doors opening on the street. In two of the plants the rooms are fairly misty with steam and yet so cold that women have to wear wraps. Under these conditions can the predisposition to pulmonary trouble and rheumatism be doubted?

In four laundries which handle waiters' and barbers' supplies the body ironer is used. The other dangerous elements in the laundries appear of minor significance in comparison with the

wreckage wrought by these machines. The majority of the operators are women. The body-ironing machine has sometimes a single, and sometimes a double, treadle. In using the latter, the operator presses with the left foot on one treadle heavily enough to lift the lower roll into close contact with the upper. To reverse the motion of the upper roll the second treadle must be pressed by the right foot. These two motions must be repeated until the garment is ironed. It was found by actual count that one woman at the reversible machine made 63 foot motions a minute; another was speeded up to 81 motions a minute; a girl at the single-lever machine made 60 motions. To relieve her feet one woman wore soft bedroom slippers; another had taken her shoes off. The manager said that in summer time practically all work in stocking feet.

The reversible body-ironer is obviously harmful to the operator for it involves a constant pelvic jerk. An improvised platform is placed in front of each machine enabling the operator to step down upon the treadles. This plan, although it facilitates the process, relieves the operator but slightly. She is required to exert a great and constant muscular force besides the pelvic jerk which is so dangerous. Few of the operators can control themselves to such an extent that they bring into play only the muscles absolutely needed. Most of them work with set, tense faces, using their whole bodies — swinging and jerking their heads and trunks. One young Irish girl who has done this work for six years has pelvic trouble, looks extremely anaemic and complains of having no appetite. She told the inspector that she had lost 50 pounds since she began. The majority of these operators look haggard, worn-out, and exhausted. To add to its dangers, body-ironing is usually piece-work and associated with all the evils of speeding.

The risk of accident is ever-present. The operator must be alert not to have her fingers crushed between the rolls. Another element of danger lies in the fumes of the gas which heats the rolls. Only one plant has equipped its body-ironer with exhaust hoods. The inspector was told, as a particularly significant and gratifying fact, that there was not a single case of heat prostration at the body-ironer during the past summer.





No. 10.— A body ironing machine without hood and forced ventilation.





In one laundry, so-called "scientific management" is maintained throughout the departments. The following is an example of problems which have been worked out by experts in the office. "If 10 women shake 6,925 towels in five hours, how many towels can one woman shake in one hour?" In this way an average of capacity is obtained and standards are set for different processes. The workers are probably unconscious of how it is done, but they feel that some power is speeding them ahead. There is no evidence that the experts are studying the fatigue of the workers and apportioning rest periods so as to prevent over-exertion.

Standing is a constant evil in laundries. Seats are provided in all of these establishments but are seldom used. A feeder on being questioned said she could not work as well sitting down. This is probably quite true where three to six women are crowded together at the feeding apron of the mangle as was the fact in this case. Sitting, at least part of the time, should be compulsory. By the exercise of a little thought and ingenuity, occupations could be alternated and the capacity of operators need not be lessened.

In a word, machine washing and ironing, as it is carried on in the motor laundries visited, retains all the worst features of domestic drudgery and adds the further evils of long hours, speeding and dangerously unhealthful conditions.

#### CANDY AND FOOD PRODUCTS.

This industry ranks seventh in the district, and third in number of women employed. It includes seven candy factories and five plants making other foods such as artificial ice, or packing dry groceries. The 12 establishments employ 517 workers, of whom 49.5% are men, 49.9% women, and .6% children. As 83% of all the workers in the food industry are in the candy trade, the conditions in the candy factories are especially considered and emphasized in the following report.

No establishment in this district occupies a plant which in any way approaches the standard set by the largest candy factories in the city.

Of the 12 establishments inspected, 7 are housed in special factories, 3 are in lofts, 1 is in a dwelling, and 1 in a tenement. The

floors occupied range from 1 to 7. In the workrooms, conditions are reported as fairly clean for 78% of the employees, and dirty or very dirty for 22%.

There are 42 water closets in the 12 food preparation establishments. Two are in the yard. Of the others, 37, or 92%, are completely separated from the shop; 3, or 7.5%, are shut off by a dwarf partition only. Seventy per cent have outside windows, which does not necessarily mean good ventilation, and 30% have no outside windows. In two places the separation of men's from women's water closets is inadequate: in one they open off a common vestibule; in the other, off the same dressing room.

The water closet accommodations are generally poor, but those for men are markedly inferior to those for women in respect to light and ventilation. Dark or semi-dark closets are in use by 47% of the males and 15% of the females. Poor ventilation of closets is reported for 31% of the males and 17% of the females.

The grade of cleanliness of the men's closets is far below that of the women's. Dirty conditions are reported for 43% of the males and for only 16% of the females. The men are naturally more careless than the women as regards cleanliness and the poorer accommodations provided for them in this trade do not encourage tidiness.

The washing facilities are very poor. The following table shows the number and percentage of workers affected by the inadequacy of the water and towel supply:

TABLE VII.

FACILITIES		Number of Workers Affected	Per cent of Workers Affected
WATER	{ Hot provided.....	201	38.9
	{ Cold only provided.....	316	61.1
		517	100.0
TOWELS	{ Adequate number supplied.....	106	20.5
	{ Inadequate number or none supplied.....	411	79.5
		517	100.0

The lack of hot water and towels is insanitary not only from the point of view of the employee's welfare, but also from that of the consuming public. The inspector has seen a candy maker in



a large factory dry his hands on a burlap bag which was the only available substitute for a towel and then go back to his candy making. In this factory other conditions correspond. The workers have no standard of cleanliness. The inspector has seen a man flatten out a large ball of candy by sitting on it and bouncing up and down, dressed in overalls that were none too clean; another worker was seen to pick up lumps that had dropped upon a dirty floor and knead them in with the rest of the candy.

In only one factory is there any attempt to make all the workers wear white caps and aprons. In this shop fresh ones are provided every day, and they are worn regularly. But this candy department employs only 39 workers out of our 430 in the candy factories. In the other places caps and aprons are worn by some of the workers, but they are in all stages of cleanliness and of dirt.

Dressing rooms are generally provided, but they are usually very small — scarcely more than coat closets. Of the women, 238, or 92%, have the use of these, 8% have no dressing rooms to use at all.

In the local candy factories there are many sources of fatigue and of actual danger which could be removed by better management.

The ordinary ventilation is inadequate, as the air is stuffy and stale, and even in mild weather windows are seldom opened. No simple devices such as window boards or boxes were found.

There are a number of processes in the packing departments of the groceries which call for special ventilating systems or exhausts, such as the packing of pepper and bottling of ammonia. On 13 out of 35 floors where there are workers, such systems or exhausts are needed. But the chief danger to health is exposure to heat and cold or to abrupt changes in temperature.

In the candy factories the steam from the cooking kettles is usually carried away by hoods and exhaust pipes. But this has little effect upon the heat, which is intense in the cooking rooms. In only one factory is there a satisfactory system for regulating the temperature. In one or two of the others there are vacuum fans, but the thermometer in one of these rooms ranged from 83 degrees to 86 degrees. Where a chocolate room adjoins the cooking room and the workers are obliged to pass frequently from chilled to highly heated temperatures, the risk is serious. The chocolate rooms are generally

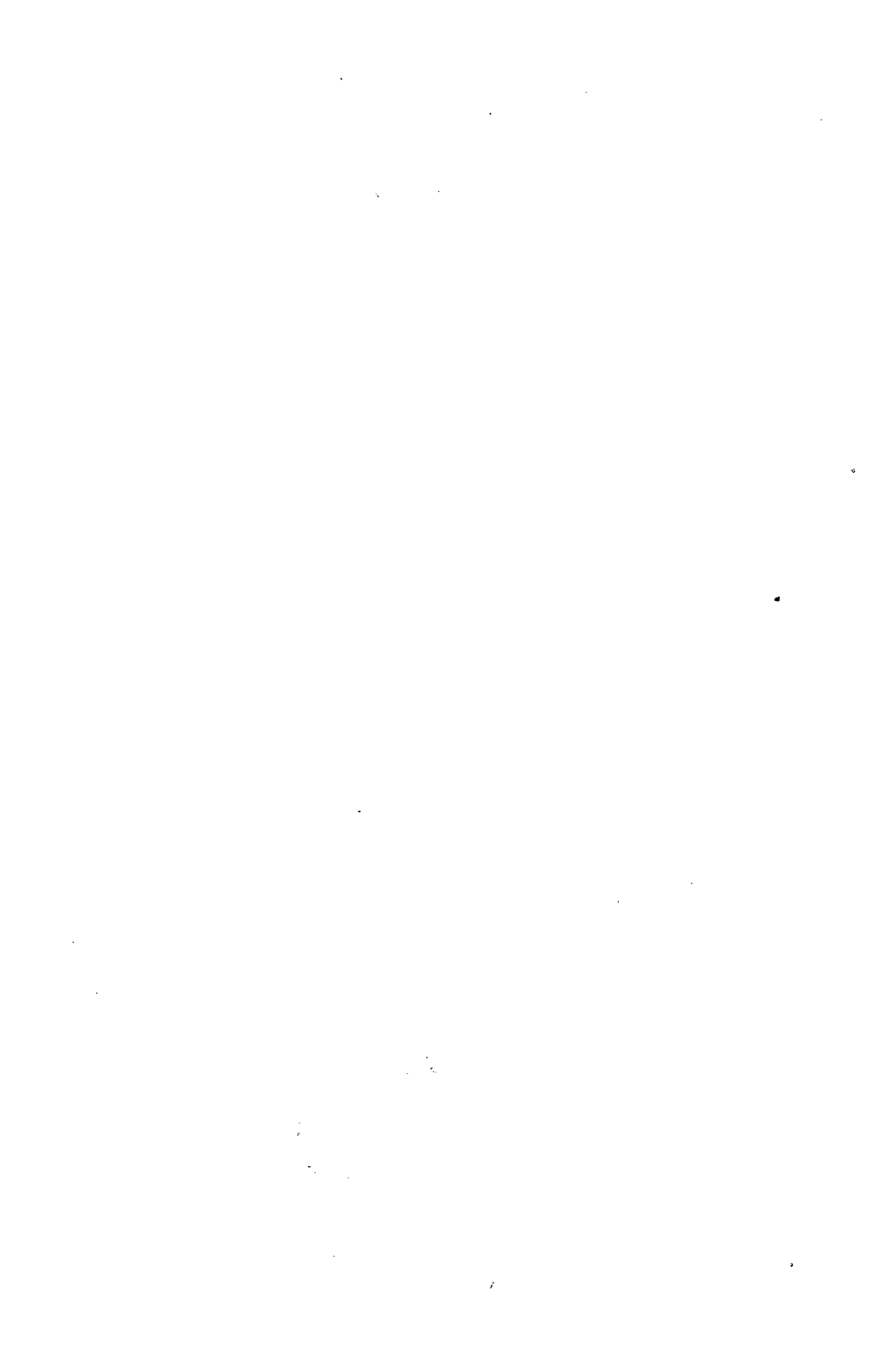
cooled by refrigerating pipes, and their temperature is sometimes as low as 60 degrees. This is unnecessarily cold; from 65 degrees to 68 degrees is said by experts in the trade to be perfectly satisfactory. The lower temperature may seem comfortable for a short time, but it is found to be chilling when the worker sits from ten to twelve hours without exercise. Many of the girls complain of this hardship. They wear shawls or sweaters. When they rest their feet on asphalt floors they feel the cold particularly. One girl was made ill by this kind of work, and was in a hospital under treatment for rheumatism of the heart and general nervous breakdown. The doctors say that her illness was caused by long hours of work under these adverse conditions. When evening work is required till 9 p. m., which is often the case, or night work, the risk to health is obvious. All such special exposures to extremes of temperature need to be carefully studied, and while they may not be injurious to some workers, the girls who would suffer from such employment ought to be weeded out by a physical examination.

In the candy factories much of the women's work is done standing. In one factory 27 bonbon dippers (45% of the women) stand continuously. Here the proprietor told the inspector that the girls refuse to sit down when seats are provided, as the dipping requires a particular swaying motion of the body which is only possible in a standing position. A more plausible explanation is found in the fact that his dipping tables were much too high. In all the other factories inspected, the dippers sit at their work.

Packing candy, moreover, usually requires constant standing or moving about. In packing the higher grades of candy, each girl has a long table on which are spread out several rows of empty boxes, with one filled box at the end to serve as a model. She then takes a handful of candies from a large box, containing only one kind, and moves along the line, putting one in the same relative place in each box. The same thing is repeated with each kind that goes in, till the box is filled. The "spread" is then completed, the boxes are closed and carried to the wrapping table; and a new "spread" of empty boxes is arranged on the packing table. Occasionally the packers also wrap the boxes, and so can sit down at intervals at the wrapping tables, but this is rare.



No. 11.—PACKING CANDY. The floor is littered with dirt, fragments of candy, card board, string, etc. The card board partitions which are used to separate the layers of candy in the wooden boxes can be seen stacked on the dirty floor under the wooden table. The women, who are Italians, stand at their work.



One machine was found which enables the packer to sit. It is a kind of Ferris wheel on which the "spread" of empty boxes is arranged; and the packer sits before this wheel except when the filled boxes are removed and replaced by empty ones. As only one such wheel was found, and that was in a large packing room where the girls had to take turns in using it, the help it gave was slight. One way of relieving the packer would be to make the "spread" smaller so that it would be within reach of the person who is seated; or possibly some sort of revolving table or a carrier or a sliding seat could be devised.

One factory in this district is exceptional in that practically all the women sit. They wrap the individual pieces of candy in oiled paper and place them directly in large boxes. Omitting this special factory there are 172 women employed in the local trade, of whom 118, or 68.6%, stand constantly. When the day's work extends to 12 hours on three days a week, as is often the case in the rush season, the strain is altogether too great.

Nationality statistics were collected from all the women in the seven candy establishments and from practically all the men. The following table shows the nationalities represented by number and proportion.

TABLE VIII.  
NUMBER EMPLOYEES IN CANDY FACTORIES ACCORDING TO SEX AND NATIONALITY

	Italian and Italian American	American	Irish and Irish American	German and German American	All other National- ities	Total
Men.....	169	1	2	6	24	202
Women.....	120	46	34	25	20	245
Total number.....	289	47	36	31	44	447
Total per cent.....	64.65	10.52	8.05	6.94	9.84	100

This shows how far the Italians have invaded this industry, as they constitute 64.65 of all the workers. These figures are the more significant in that the Italians do not form a large percentage of the population of the neighborhood.

#### BAKERIES.

In making the bakery inspections, two things were kept in mind: conditions as they affect the workers and conditions as

they affect the consumers of the bake-shop products. The bakeries are unique among the industries studied, inasmuch as 85% of them sell all their product right on the premises.

Sixty bakeries were inspected employing 266 workers. In all but two shops, the working force numbered less than eight. Of the two larger bakeries, one employed 18 and the other 32 men.

With but three exceptions, all the shops are located in cellars of tenements. Concrete floors, the most desirable floor for bakeries, were found in 33% of the shops, and wood on concrete in 40%; the remaining 27% consisted of varying combinations of wood and concrete. Many of them were worn and broken so that it is impossible to keep them clean. But even where the floors were intact, a clean one was a rare find. In two shops, water was seeping through the walls. In one of these, a small drain had been cut across the cement floor leading into an unused cellar where a cess-pool received the waste. The stench arising from this pool was as bad as any noted in the worst-conditioned water closets.

The walls and ceilings are badly neglected. The walls, of brick or stone, roughly plastered or simply white-washed, form a rough surface difficult to keep clean. Dirt and cob-webs cling to it, and in some places, even splatterings of dough were found.

The white-wash on the walls and ceilings in many cases had not been properly renewed and was peeling off above the kneading troughs.

Fair conditions of cleanliness are reported only for the three shops not in cellars. These employ 40 workers, or 15%. Of the others, 134, or 50%, work in dirty shops, and 92, or 35%, in very dirty ones.

The windows are small and dirty. Twenty-two per cent of the shops have nothing that may even serve as a window. Artificial light by day is necessary in all but two of the shops. An open gas flame is found in every shop and helps to consume the all too-limited oxygen supply in the cellar rooms. Even where electric lights are used, gas lights are found near the ovens.

If lighting is poor in the cellar bake-shops, ventilation is even poorer. The only special means of ventilation found was in a shop where an electric fan was used to freshen the air. The low

ceilings contribute a great deal to the bad air conditions. The shops were divided as to height of ceilings as follows:

HEIGHT OF CEILINGS

	Less than 7 ft.	7 and 8 ft.	8 and 9 ft.	9 and 10 ft.	10 ft. and over	Un- known	Total
Number bakeries.....	1	5	28	21	4	1	60

Ten per cent are less than 8 feet and 57% less than 9 feet.

The temperature was also recorded. The highest reported was 88 F. Ten per cent of the shops were above 80 F. and 33% were below 70 F., ranging down to 59 F. The most serious feature of the temperature conditions is not excessive heat or cold, but sudden changes from one to the other. The shop gets too hot for comfort and the door is thrown open, allowing the cold air to rush in upon the men who are always scantily clothed.

The air is also vitiated by the cooking done. Pastry is made in 87% of the shops. This means that the odor of frying oil hangs always in the air. Many of the ovens have poor drafts and fill the shop with coal-gas at each firing-up. With five exceptions, all the shops fire their ovens inside. One has gas ovens and four fire underneath. The bad air conditions arising from the several causes given can not be removed by ventilation from the street. The bakery is underground and any attempt to introduce air from the ground-level in front simply results in admitting to the shop sweepings from the pavements.

The majority of the water closet apartments are completely separate from the shop. Even ~~where~~ they are contiguous the separation is adequate. However, two were found in store-rooms with no enclosure whatever. Taken as a whole, ventilation is good and light fair — conditions which are due to the fact that most of the closets are located in the yard. But 26% are dark or semi-dark; 15% are insufficiently ventilated; 35% are dirty, or very dirty.

In all the shops but one, the men have only the sink for washing. One place has two shower baths, which, evidently, are not used, as the inspector noted that they were covered with cobwebs. Only two places were found with really clean sinks; the others were repulsively dirty. In a few, towels were noted, but they were extremely dirty.

The provision of special dressing-rooms is as follows: in 7% of the shops the bakers live upstairs and change in their rooms before going down; in 5%, dressing-rooms are provided; in 35% lockers only, but no dressing-rooms are provided; in 48% neither lockers nor dressing-rooms; and 5% are unreported. Thus about half the shops are without dressing-rooms of any sort. This means that clothes and shoes were left standing about the room.

About 44% of the shops provided cuspidors, but in only 8% were they found to be in use. When the inspector inquired about them, they were usually dragged out from the corners, or from under boxes or barrels.

Power-driven machinery was found in but 22% of the shops. By actual count, 21 pieces of such machinery were found in 60 bakeries.

Cats were seen in practically every shop. In two shops litters of kittens were being raised. No windows are screened for flies, but as the inspections were made in winter, few flies were discovered. In seven shops cock-roaches were conspicuous. The so-called "Baker's Souls" or "silver bugs" were seen in every shop except the one using gas ovens.

In 90% of the places the materials for baking are stored right in the shops. In 47%, flour is kept in burlap sacks with no other protection, and cats were found sleeping on them. In 45% of the shops the material was found flat on the floor and in about the same number the barrels and boxes had no cover whatever. From the time a barrel of cooking oil is broached until it is used up, it stands an open trap for unwary flies and cock-roaches. In one place an old coat, hung upon a nail, trailed actually into the cocoanut supply.

All the workers are male except two women who are employed as demonstrators of special gas ovens. No boys under 16 are employed. Ten per cent of the men are 45 years and over. They



are divided as to nationality as follows: German, 67%; Austrian, 9%; Italian, 8%; other nationalities, 16%.

Of the 60 shops, 47, representing 71% of the workers, employ non-union men only; 4, representing 11%, both non-union and union; 15, representing 18%, only union men.

Most of the bakers claimed to work only 10 hours a day and 6 days a week. As a matter of fact, they generally have no regular time to quit. Ordinarily they begin at the scheduled time, and quit when they finish — be it 10 hours or 14 hours later. Two or three of the largest shops work Sundays, but they claim that they have enough men to allow each one day off in seven.

As the majority of the shops have two shifts and ordinarily only one shift was inspected, the reports on the physical appearance of workers is based on the number actually seen and information obtained from the workers regarding those absent.

Smoking was reported in but 25% of the shops and chewing in 8%. The use of tobacco was reported only where it was actually seen or the men admitted the habit. Some of them tried to conceal the fact that they used it in the shop; others seemed not to know that it is illegal. However, as the majority of the workers in question are Germans and they are little given to the habit, the low percentage reported is probably correct.

Beer drinking seemed commoner. Only five shops were met with where it was said that none of the men drank beer. Lunch is eaten in the shops and beer is almost invariably an accompaniment. The lunch hour is irregular; the men eat when they feel hungry and can leave their work for a few minutes.

All the workers change their clothes on going into the shop, though few make a complete change. The men seemed to consider this necessary not from sanitary reasons or consideration for the consumer, but from a desire not to carry the strong bakery odor on their clothes when they leave the shop. The working clothes seen were, on the whole, extremely dirty.

The danger to consumers, needless to say, arises from the appalling lack of sanitary conditions under which bread stuff is produced. Not only are the quarters dirty and insanitary, but the habits of the men are careless, at their best, and revolting, at their worst. They wash their hands but rarely. After firing the oven,

even after handling coal and floor sweepings, they were seen to return to the kneading trough without so much as wiping their hands, except possibly on their dirty trousers. One man took great pride in showing a litter of kittens he was raising in the shop. After handling the kittens, he returned to the kneading trough without washing his hands. Another man, who was suffering from a cold in the head, went about his work absolutely unprovided with a pocket handkerchief.

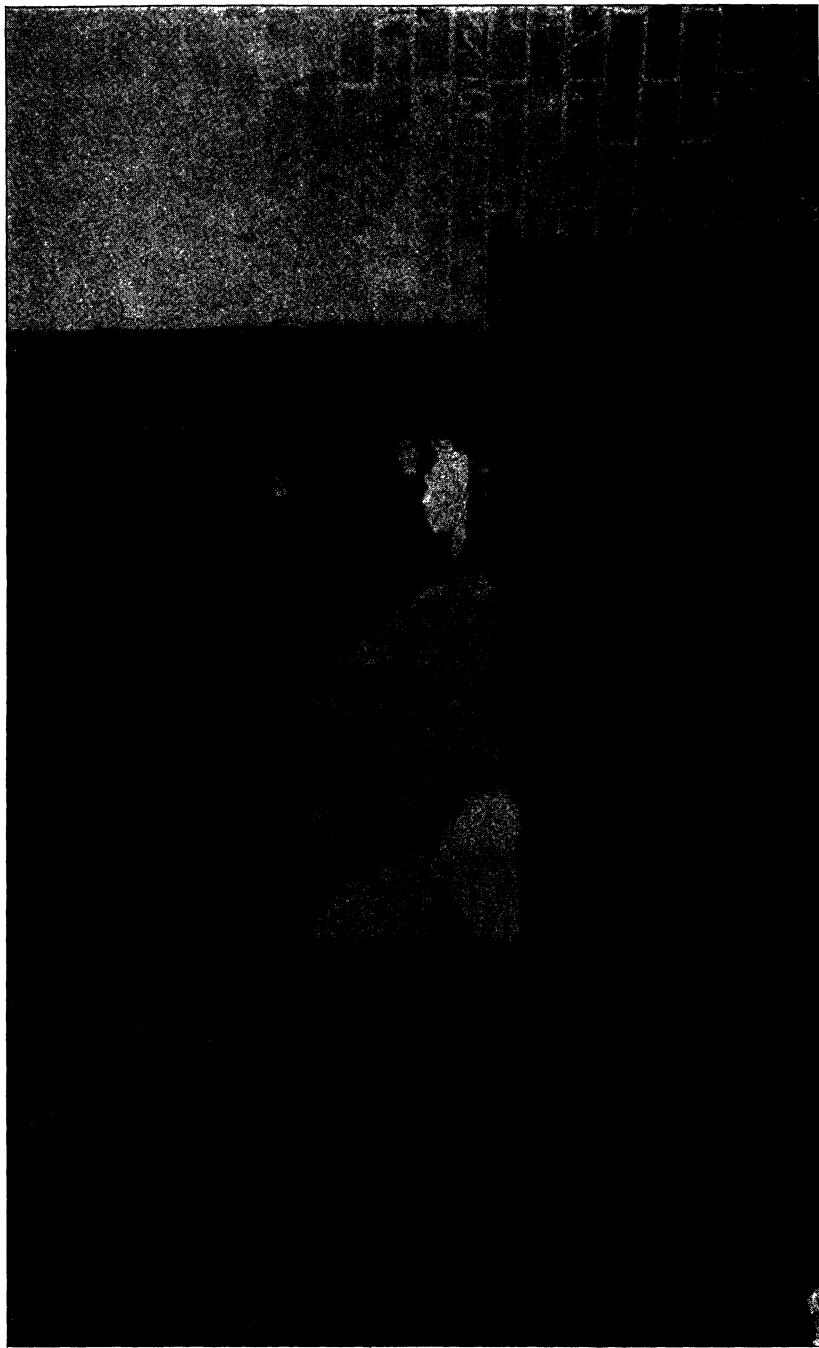
In one of the shops, a pastry worker who was decorating a cake with jelly, was observed to pour out the jelly on a sheet of dirty paste-board, hastily snatched from the floor for the purpose, and afterwards to scrape the jelly from this paper into the original supply.

In transferring the dough from the troughs to the kneading boards, the men often rest the mass against their bodies, or rather, against their clothing, which, as has been remarked, looks as if it were seldom washed. In one rather pretentious shop, catering to a high-class trade, all the men were stripped to the waist, and in carrying the dough they rested it against their naked bodies.

One of the crudest things witnessed occurred in the preparation of the so-called "Vienna" loaf for the oven. From nine to twelve loaves are placed on a large paddle; the slits are then made with a thin-bladed knife, and the loaves slipped into the oven. In not less than three shops the men were observed to keep the blades of their slitting knives in their mouths while they were slipping one paddle of loaves into the oven and filling it up again. The men claimed that it made the knife cut better.

From the standpoint of the workers, the chief danger is the gradual undermining of health which naturally follows under conditions of the sort described. Lack of proper light and ventilation, long hours, night work, and uncertain temperature caused by the method of ventilation — these things can only result in lowering the vitality of those subjected to them.

Owing to the fact that the local bakeries do not possess power-driven machinery to any extent, the very serious danger of accident from this source will not be considered in this report. On the other hand, it must be pointed out that the insidious dangers to health which result from doing this kind of work in cramped,



No. 12.—LAUNDRY. Entrance from the street, which indicates that this building was originally a stable. The soiled and clean clothes are not kept separate. General disorder and uncleanness prevail.



airless, underground quarters are especially characteristic of the bakeries in the district.

#### GARMENTS AND TEXTILES.

The textile trades, which formed the chief occupation of women on the West Side twenty years ago, have greatly declined in importance. Only 2 weaving mills were found. These, together with the embroidery, garment and costume-making shops inspected, make up the 11 establishments included in this group. Although women predominate, constituting 60% of the 254 workers employed, they are numerically fourth in importance, compared with printing, laundries, and candy-making respectively.

Fairly clean work-rooms are reported for 138, or 55%, of the employees, and dirty work-rooms for 116, or 45%. Water closets are reported as dirty for 17% of the men and the same percentage of the women. The proportion of workers, male and female, that have badly lighted water closet apartments is also 17%. This correspondence in percentages indicates the connection between darkness and dirt in these places already mentioned in this report.

One establishment has only 1 water closet for 54 female employees.

The provision of washing facilities is inadequate for 38% of the employees. Towels are supplied for 97% of the workers.

Ninety per cent of the women have the use of a separate dressing room or wash room; only 5% have clothes lockers.

In all the weaving factories, artificial light by day is necessary. The electric lights above the warping mills, or frames, are usually above eye-level, but the lights over the looms are so arranged as to shine directly into the weaver's eyes, unless of his own initiative he protects them by a close-fitting shade.

#### STONE, CLAY AND GLASS.

The stone, clay and glass-making trades, which have the common element of being dust-producing occupations are represented by 7 establishments. They give employment to 213 male workers, one of them being a boy under sixteen.

Of these, 72, or 34%, work in fairly clean places. In estimating the cleanliness of the shop-rooms, allowance was made for the presence of an unavoidable amount of waste. Places were only classed as dirty when waste had been allowed to accumulate and neglected conditions prevailed. Of the workers, 118, or 56%, are engaged in shops of this character, and 22, or 10%, work in rooms where the floors are in a state of filth. Forty-four per cent of the workers have fairly clean water closets and 56%, dirty ones. The lighting of the water closets in these trades is especially poor, 72% of the men being subjected to semi-dark water closet apartments. Sixty-five workers, or 35%, have inadequate washing facilities. Fourteen per cent have cold water only for washing, and 37% have no towels.

One factory produces fire-proof tiles. Apparently no effort is made here to remove the gritty dust which accumulates indefinitely on the earthen floor. The installation of a concrete floor which could be cleaned up would be a great improvement. The air is permeated with coal-gas from the kilns.

It has no system for ventilating and cooling the ovens, although in many other factories of this kind there is a blower which forces air through a pipe from the outside into the ovens. Manifestly a factory of this kind is out of place in a crowded city. This particular factory is a survival from an earlier, less populous period in the district, and continues in the city although it must bring its raw material by canal boats from New Jersey.

In another factory where mirrors are made, the dust present is due to red rouge, an oxide of iron used for polishing, which though not inherently poisonous, is exceedingly irritating to the respiratory tracts.

#### MINERAL AND SODA WATERS.

Twelve establishments, of which 9 are engaged in the bottling of aerated or mineral waters and 3 are miscellaneous bottling works, compose this group.

As to the kind of building occupied, 4 are in special factories, 4 in lofts, 2 in converted dwellings, 1 in a dwelling, and 1 in a tenement.

The number of workers employed is 158. Of these, but 3% work in shops that are below "B" grade in cleanliness. In this grading, wet floors are not rated as dirty, but as insanitary from the point of view of health.

Conditions in the water closets provided are not above the average for the district. For 56% of the workers, these apartments are reported as dirty, as dark or semi-dark for 48%, as poorly ventilated for 28%. Of the total number of water-closet apartments, 25% have no outside windows and 13% are separated from the shop by dwarf partitions only.

Washing facilities are inadequate for all employees, inasmuch as towels are not supplied in a single instance. On the other hand, all factories have hot water.

The dangers in this trade result from constant dampness and broken glass.

Where the washing and filling are going on, the floors are always more or less wet. The men who do the washing have their hands and arms continuously in the water. This condition of things can be improved by the use of a proper washing machine. The wet floors also result from the breaking of bottles in the filling process. To prevent this, an adequate waste-pan should be built around this machine.

Accidents from broken glass occur in washing and filling the bottles and from the bursting of bottles already filled. A washing machine removes most of the dangers connected with hand-washing. Bottles that have been filled and labeled should be instantly removed from among the workmen and placed in a store-room.

In one establishment employing 10 men, 2 were at home through accidents at the time of the inspection. One man had been laid off for 10 days with a cut received while washing bottles. Another had been out a week for the same reason. Another had just returned from a 4 days' absence, caused by a cut in the palm of his hand. One of the men had suffered the loss of an eye. In response to the question, "Do you ever get cut?" one workman replied, "I get cut every day."

The great majority of cuts and wounds, however, occur in connection with the filling process. All the carbonated waters are bot-

tled under pressure, and the siphons under much greater pressure than the sodas. In all the shops the siphons are placed in iron cages while being filled. The cage imprisons a part of the flying glass, but splinters and particles escape. As a further protection, masks and gloves should be worn. Masks are furnished by all the shops, but only one place was found in which the wearing was made compulsory by the management. In another shop, it was explained that the masks were furnished, but, as one workman jovially remarked, "only the married men wore them." Gloves are even less worn as a protection than masks, as their use is rather awkward in operating the machines. Except in one shop, the machines for crowning the soda bottles are of the hand-fed variety and difficult to feed when the operator wears gloves.

An Italian foreman, whose face and hands were covered with scars, showed a particularly ugly one on the hand and wrist from a cut in which blood poison had developed. This wound, which had disabled his arm for two months, had been received while simply passing by the machine where another man was at work. Another workman had been laid up seven weeks with a cut which had nearly severed the tendons of his fingers. His face and hands were covered with scars, but in spite of all these accidents he had only lately taken to wearing a glove, with the finger-ends cut off, as a partial protection.

One firm was found which had reduced all these dangers to a minimum by the installation of a washing machine, a self-feeding crown machine, and the compulsory use of gloves and masks.

#### DYEING AND CLEANING.

The 10 establishments representing the dyeing and cleaning industry are divided as follows:

Textile dyeing and printing.....	1
Carpet cleaning.....	2
Skein-silk dyeing.....	3
Custom dyeing and cleaning.....	4

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Total .....	10
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The buildings occupied are of all grades, varying from a ramshackle rear tenement, now used for silk-dyeing, to a modern and well-equipped carpet-cleaning factory. The average cleanliness is fair. Of the 140 workers, 119, or 85%, work in fairly clean shops; 21, or 15%, in dirty shops.

Dark or semi-dark water closets are supplied for 45% of the men and 16% of the women. Poor ventilation of these apartments is reported for 35% of the men and 16% of the women. Not only are light and ventilation both worse for the men than for the women, but men's apartments are also more neglected. Not quite 16% of the women use water closets that are not clean, whereas 70% of the men use closets that are actually dirty.

Washing facilities are inadequate for 87% of the employees. Hot water is provided for 49%, and 59% have cold water only.

No shops have enough towels: 38% have an insufficient supply, and about 62% have no towels at all.

As the workmen keep their hands in the dyeing and rinsing tubs most of the time, they are inclined to think that they do not need to wash up. But the dye should not be allowed to remain on the hands, and water, soap and towels should always be supplied to remove it.

Five of these establishments employ from 1 to 27 women. Only 1 of them, with 4 women workers, has a separate dressing room for their use.

In the custom dye works and the skein-silk dyeing the method is much the same. The dye room has a cement or flagstone floor, graded for drainage. Dyeing and scouring with soap are sometimes done in separate rooms, but generally the same room is used for both. In 6 of the 8 establishments the drainage is inadequate and the floors are very wet. The men generally wear shoes with thick wooden soles. In only one or two rooms is the drainage effective. In most places the scouring tables drain only to the floor. But in one carpet-cleaning establishment the tables shed the dirty water into troughs, which conduct it to waste-pipes.

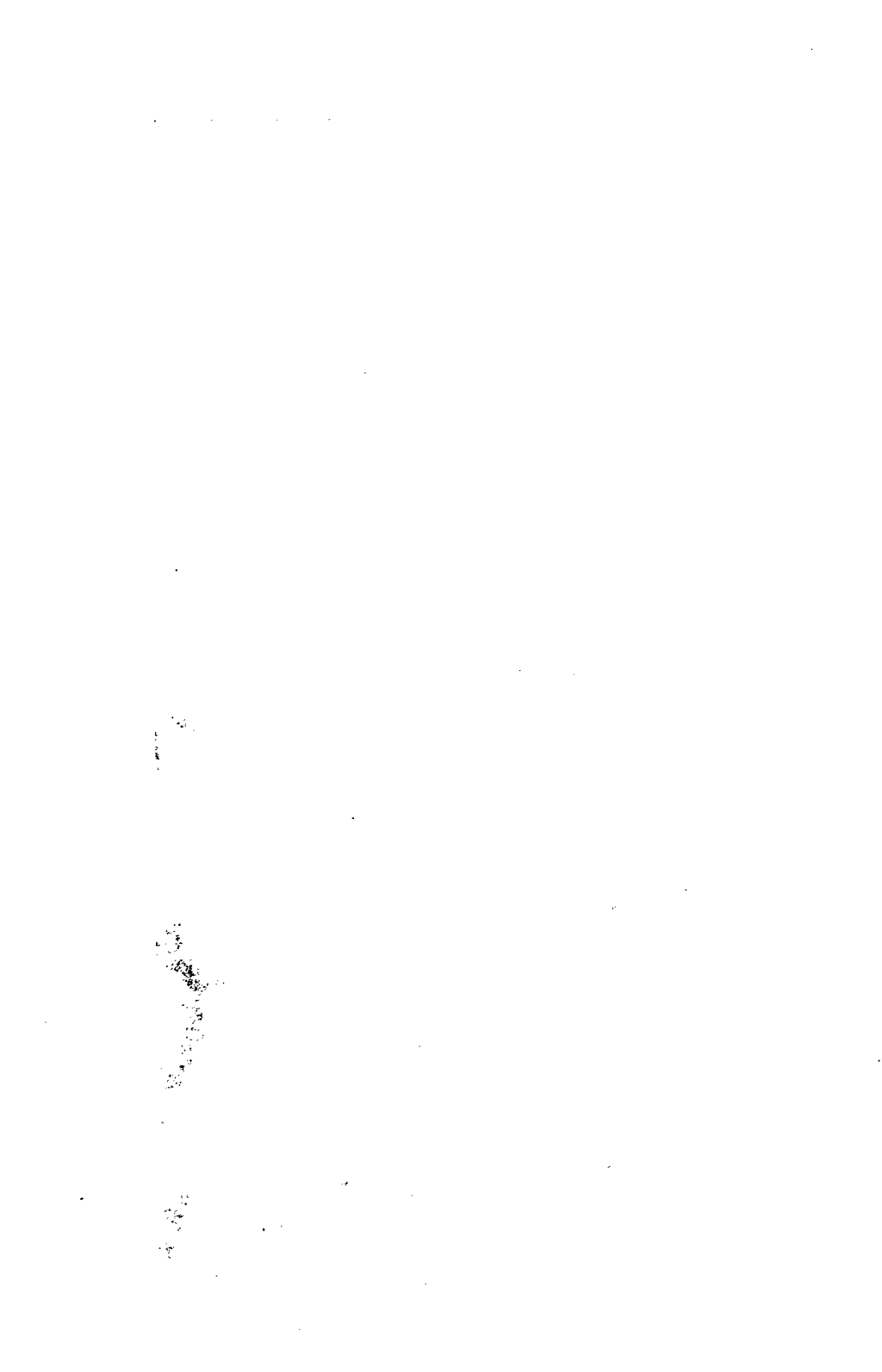
Articles are taken from the dye tubs by hand, or with a stick. Where aniline dyes are used, it is evident that adequate washing facilities should be insisted upon. Other unpleasant features of a dye room are the steam and odors that fill the air. In no establish-

ment are the separate tubs or vats provided with hoods and exhaust pipes. In one room there are four ventilating stacks rising from the four corners of the room, which carry off the vapor in part. In another shop, where ribbon and textile dyeing is done, a large tube runs the length of the ceiling, with openings at intervals. A powerful vacuum fan is placed near the vent to the outer air. This was the only satisfactory ventilator found. In the others, windows and doors are the only means of ventilation, and to open these is usually to expose the overheated workers to drafts and sudden changes in temperature.

In the dry-cleaning industry the dangers are from fire and benzine or naphtha fumes. Four of the factories do dry cleaning, and in all of them the fire risk is considerable. The room in which the clothes are washed in gasolene or naphtha is fairly well protected by metal floor coverings and ceilings. In these rooms there is no lighting and heating apparatus. In one case the dry-cleaning room is a small separate house built in a back yard. But the drying rooms and "spotting" rooms (where the left-over spots are taken out by hand with chloroform or alcohol) are often entirely finished with wood. The buildings in which these shops are located all have wooden stairs and are by no means fireproof. The danger seems to be less from explosion of the fluid itself than from the inflammability of the articles that have just been cleaned and the fumes which come from them. Exposure to intoxication by benzine or naphtha fumes results in nausea, loss of appetite and anaemia. Young people, especially girls, are most sensitive to these effects. In one or two cases ventilating pipes were found in the cleaning rooms, but in no case is there a thorough ventilation system for drying and sorting rooms or for the entire factory. One drying machine was found which consisted of a revolving cylinder, perforated like an extractor and enclosed in a case into which a current of hot air is forced and from which it is withdrawn by a vacuum fan. In this way the fumes were partially prevented from escaping into the room.

In the carpet-cleaning factories the beating is entirely done by machines. One type was a "non-labor" machine, into which the rug or carpet could be completely inserted and left alone until thoroughly beaten. Unfortunately, this machine is hard on the

No. 13.— WOOLEN RAGS STORE ROOM. Italian women sorting woolen rags collected from households. The rags have not been cleaned or disinfected.



texture of the rug. The ordinary cleaner, however, has to be tended. It consists of a long revolving drum to the surface of which leather straps are attached by one end. The carpet passes beneath this drum and is beaten constantly and violently by the leather thongs. The whole is enclosed in a box equipped with an exhaust system, by which the dust is carried away. The men who pull the rugs back and forth are thus effectively guarded from the dust as long as the machine is in good working order.

#### TOILET PREPARATIONS AND CHEMICALS.

The making and packing of soap, toilet powder, hair tonics, patent medicines, gum and mica employs 94 workers, divided among 10 establishments.

The work is done in shop rooms which in no case are kept in really good condition. Of the workers, 84% are in fairly clean rooms and 16% in dirty ones.

Dark or semi-dark water closets are reported for 27% of the women and 41% of the men. For 25% of the women and 73% of the men the ventilation of these apartments is poor. The condition of the water closets is seen from the fact that 22% of the men and 98% of the women use closets of "B" grade. Seventy-eight per cent of the men and 2% of the women use toilets that are actually dirty. Forty-two per cent of the water-closet apartments have no outside windows.

Only 74% of the workers are reported as having adequate washing facilities. Eighty-one per cent have only cold water to wash with, and 76% have either an insufficient towel supply or none at all. This low standard in washing facilities supplied and personal cleanliness among the employees is strikingly out of place in factories whose product must bear a government guarantee of chemical purity.

The packing of talcum and other powders is done by hand and the room is filled with the white, irritating dust. The girls protect their hair with paper caps, but there is no protection for their lungs. No respirators were seen.

#### BREWERIES.

The brewing industry gives employment to 86 men. There are 4 establishments, all housed in special factories. Of these 86

workers, some are engaged in bottling and a few are coopers. One firm, which furnishes fixtures to saloons handling its product, has 4 men employed to keep the fixtures in repair. But 53 men are employed in the brewing industry proper.

The cleanliness of the workrooms is fair; only 8 men, or 9%, work where conditions are bad. The water closets, however, are poor. Eight out of 13, or 62%, are separated from the shop by dwarf partitions only. Forty per cent have no outside ventilation. Of the workers, 70% must use water closets that are semi-dark. For 35% of the men the ventilation of the water closets is poor, and for 11% the flush is inadequate; 65% use toilets which are fairly clean; 35% use closets that are really dirty.

Hot water is provided for washing for 72% of the workers; cold water only for 28%. None of the workers are furnished with towels.

The workers are divided into: (1) the brew-house men, (2) the wash-house men, (3) the racking men, (4) the ice-house men.

The brew-house men are subjected to no special dangers. The dust in the milling room, due to cleaning and grinding the malt, would be a real menace to any one who worked in it continuously; but in these establishments the work requires only a small part of one man's time. The wash-house is where the barrels are washed and inspected. Here the floors are always wet and the men more or less so.

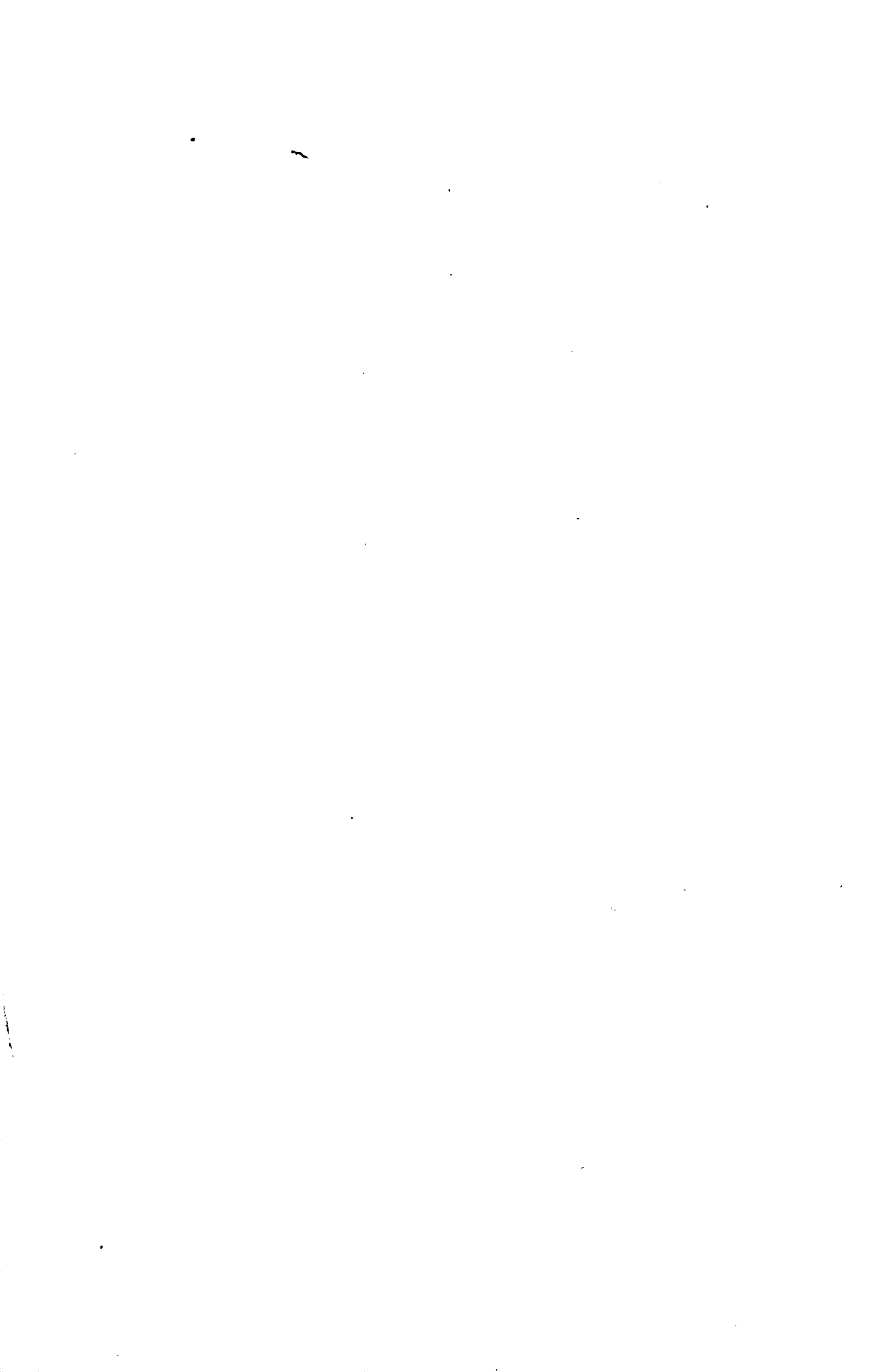
The racking, that is, transferring the liquors from the storage casks to kegs and barrels, preparatory to shipping, is largely done in cold, damp cellars, and not infrequently in the ice-house, where the beer is stored in vats to ripen. The air is chilled by ammonia pipes, and the temperature is from 36 to 38 degrees Fahrenheit. The floors are always wet.

Of the 53 workers, 18, or 34%, work in the ice-house most of the time. Twenty-one, or 40%, are employed at washing and racking. Thus nearly three-fourths of the brewery men work where it is always wet, and one-third where it is both wet and cold.

#### RAGS.

One establishment, employing 16 persons, handles cotton and woolen rags. The sorters are women. They sit on the floor and

separate the woolen rags according to colors. These rags have been collected from households and shaken out by the collectors, but have not been cleaned or disinfected. They give off dust at each handling. The cotton rags are sorted in the adjoining room, where the light and ventilation are fairly good. They are even more unpleasant to handle and more likely to convey infection.





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## APPENDIX VI

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### OCCUPATIONAL DISEASES

A PRELIMINARY REPORT ON LEAD POISONING IN THE CITY OF  
NEW YORK, WITH AN APPENDIX ON ARSENICAL POISONING.

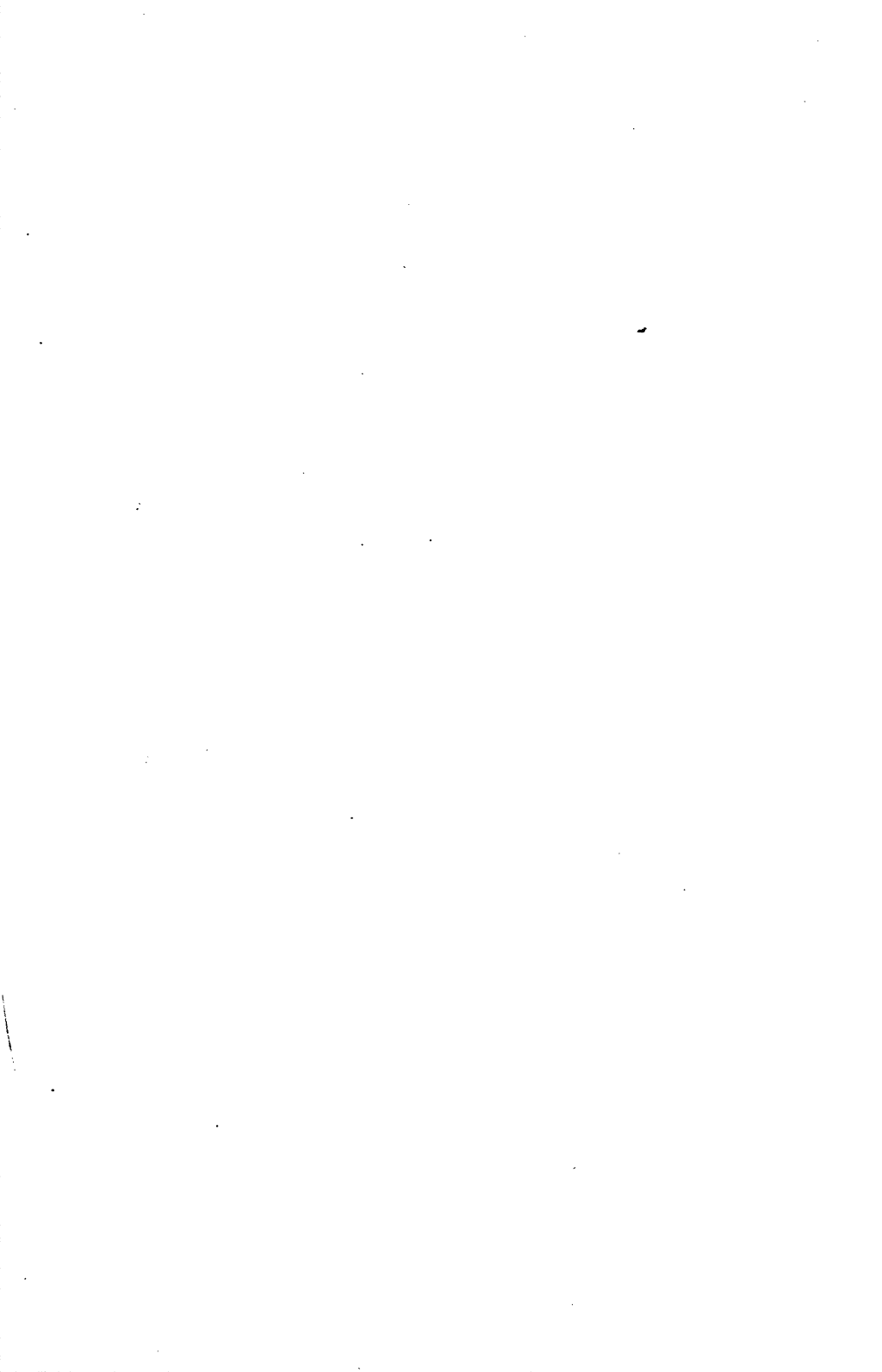
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## PREFATORY NOTE

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The investigation, the results of which are herein presented, has been made in large part by a group of thirteen students in the New York School of Philanthropy, in connection with my course on Methods of Research and Statistics. This work has occupied but a very small portion of their time, not exceeding an average of six hours each per week, over a period of ten weeks. The majority of the individual cases of lead poisoning were investigated by the students and their descriptions are used throughout. They have also compiled the tables analyzing these cases.

I take this opportunity of expressing my indebtedness to the members of this group for their assistance in collecting this information and for their loyal support. The group was composed of the following persons:

Miss Elizabeth Botsford	Mr. H. H. Jones
Miss Marie L. Chase	Miss Mildred Plumb
Miss Grace W. Cottrell	Miss Anne M. Sloan
Miss Euphemia G. Cowan	Miss Mary C. Snyder
Mr. Solon DeLeon	Miss Helen F. Veasey
Miss Evelyn H. Ellis	Miss Mary V. Walker
Miss Blanche W. Hull	

The writer wishes also to express his appreciation of the services of Miss Alice Keyes, Assistant in the Statistical Laboratory, who has attended to a large amount of the detail and clerical work.

E. E. PRATT.

# CHAPTER I

## INTRODUCTION.

Doubtless we in America often think that we are not afflicted with the deadly diseases which are found in Europe. We are often tempted to congratulate ourselves that conditions here are not like those abroad, that our workers are stronger, healthier and more intelligent, that our standard of living is higher, and hence our resistance to disease greater. Statements like these are often made in connection with industrial diseases. The small number of cases of lead poisoning is attributed to better conditions in the lead industries in this country and to a stronger, healthier, labor supply. It may be that this is true. I hope it is, but recent investigations throw some doubt upon such conclusions. During the years 1908, 1909, 1910, the Illinois Commission on Occupational Diseases<sup>1</sup> discovered 578 cases, and 6 suspected cases, of lead poisoning in that state alone. In England during the same years, there were only 1,704 cases of lead poisoning.<sup>2</sup> In 1910 there were but 505 cases of lead poisoning reported to the authorities.<sup>3</sup> During 1911, the very cursory investigation which I have been making reveals 121 cases in New York city alone. A total of 376 cases were found, mainly in 1909, 1910, 1911. This number includes only cases which were relatively serious, consisting largely of hospital cases. The vast number of dispensary cases and persons treated by private physicians is not included.

In most of the European countries, the subject of lead poisoning has been thoroughly studied. The governmental authorities are alive to its gravity and to its importance. It is reasonable to believe that we know how much lead poisoning there is

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<sup>1</sup> Report of Illinois Commission on Occupational Diseases, p. 44. (The Commission does not clearly state that the cases occurred exclusively in these years.)

<sup>2</sup> Report of Factory Inspector Great Britain, 1910, p. 170.

<sup>3</sup> Ibid. p. 170.

in Germany, France and England. The same cannot be said of the United States. We do not know, even approximately, how much lead poisoning there is in the United States, or in any one state. This ignorance is due to certain causes which are now coming to be recognized. Our physicians are uneducated along these lines, they fail to recognize occupational, or industrial diseases because they have been interested merely in treatment and not in the elimination of disease. There has been no method of recording or publishing the number or extent of cases of industrial disease, and inadequate hospital records furnish but vague clews to the industrial causes. Many of the industries which are the most prolific of industrial diseases — this is especially true of lead poisoning — are those whose ranks are filled with the unskilled, non-English speaking workers, who find it difficult to make known their ills, and who pass rapidly from one industry to another.

Very much greater progress has been made in European countries, both in the study and elimination of lead poisoning, than we in the United States have even thought of making. In the German cities, for example, Berlin, Munich and Frankfurt-on-Main, there are permanent Museums of Safety that give no small part of their space to illustrations of lead poisoning and lead industries, to samples of the materials and to models showing the best methods of prevention. Last summer in Dresden there was a great Hygienic Exposition, dealing with every phase of ancient and modern methods of hygiene. The subject of lead poisoning played a very important part. Many of the European countries such as Germany, France, Belgium, Holland and Great Britain have passed stringent regulations for safeguarding the workers in various industries using or manufacturing lead in its many forms. In England, notable progress in cutting down the amount of lead poisoning has been made. In 1900, there were 1,058 cases of lead poisoning reported by the Medical Inspector of Factories; in 1910, this number — largely by means of special regulations — had been reduced to 505 cases.<sup>1</sup>

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<sup>1</sup> See report of Factory Inspector 1910, p. 170.

In this country, there are only three studies of lead poisoning which are worthy of any note. These are: the study made by the Illinois Commission on Occupational Diseases, conducted under the direction of Dr. Alice Hamilton and published in the Report of the Commission in January, 1911; second, the report of the Federal Investigation of the White Lead Industry, carried on under the direction of the Commissioner of Labor, by Dr. Hamilton; and third, a study by Dr. John B. Andrews, of sixty fatal cases of lead poisoning occurring in New York State in the years 1909 and 1910. These studies furnish but meagre data on which legislation may be based. The study, the results of which are presented herewith, is but a preliminary survey of the field. The further the investigation was carried the more serious has the problem become. In the time at the disposal of the people who have made this study, it was impossible to study and inspect even representative establishments of all lines of industries, much less all the establishments in these industries. Nor has time permitted the close personal investigation of all the cases which have been found. The most valuable results of the entire investigation are doubtless to be found in a close study of these individual cases. They are presented here in considerable detail, in order that the whole story may be given, and not a mere frame work devoid of interest or supplementary information.

The pictures which are presented in this report, which have been taken through the courtesy of the factory owners, do not aim to show bad conditions, or good conditions. They have been taken with a view to clearly setting forth the nature of the processes of the various industries. Some of them do show that conditions need to be improved and greatly improved; others furnish a basis for suggesting such necessary improvements.

The writer and his assistants regret that the amount of information is not larger, that more factories were not inspected, that more cases were not subjected to a detailed and searching investigation. The results attained are merely preliminary and it is sincerely hoped that the investigation may be enlarged and

carried on throughout the State, more thoroughly and more extensively.

The recommendations which we have been bold enough to offer are the most elementary and elemental in their nature. The data herewith presented form, we believe, an adequate basis for these recommendations. More detailed recommendations covering each industry can be made only after a more detailed and more comprehensive study.



## CHAPTER II

### LEAD POISONING IN EUROPEAN LEGISLATION.<sup>1</sup>

#### ENGLAND, GERMANY, FRANCE AND BELGIUM.

Among all the countries of the world, Germany is beyond doubt to-day the one with the greatest mass of legislation bearing on the question of lead poisoning. Not only was it one of the first in the field regulating the employment of women in lead mines in 1892, and not only do its statutes cover the greatest number of industries, but it stands out as remarkable in the characteristic Teutonic thoroughness and minuteness with which it lays down the conditions under which each particular lead trade shall be carried on.

While Germany sets the pace, England and France are close at its heels. In all three of these countries the workers in the more dangerous trades are forbidden to eat or to leave the premises where they are employed without first thoroughly washing their hands and faces and in some instances their mouths and noses also. No food, no beverage, no tobacco whether for smoking, chewing or snuffing, is allowed to be used or even carried into the workroom. In the dusty trades such as white lead making, lead oxidizing and storage battery manufacture, the men must take warm baths regularly, sometimes weekly, sometimes daily. In England in the white lead industry, a register is kept of these baths.

Practically everywhere the emphasis is thrown on ventilation; lighting is mentioned; a thorough cleaning must be given to the plant at regular intervals; the employer must furnish clothing, lockers, washrooms and dressing rooms supplied with hot and cold water, soap, towels and nailbrushes; and he must set aside a dust-free room for a lunch room, warmed in cold weather, and frequently provided with means for warming the workmen's food. In some of the more trying trades, the hours

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<sup>1</sup>The writer is indebted to Mr. Solon DeLeon for the summary of legislation presented in this chapter.

are made short and broken by frequent pauses. Belgium forbids women from working in the china and earthenware trade for four weeks after confinement.

Germany in the lead smelting, white lead, lead oxide, storage battery and painting trades, and England in all but the last of these with earthenware and yarn "heading" thrown in, require a "control book" or health register. The German book is a very elaborate affair, requiring entries of the name of the person keeping it, first and last name, address, age of each workman, date of entering and leaving the employ of the factory, date and nature of his illness, date of his recovery, name of the factory physician, and dates and results of the medical examination. The employer is responsible for the correctness of this record and must show it to the factory or medical inspector on demand.

Before a workman in Germany, France or England can legally get work at one of the dangerous lead trades, he must provide himself with a medical certificate showing that he is of sound physique and constitution and fairly capable of withstanding the poisons he will have to work with. Medical supervision is very strict according to the letter of the law, ranging from one examination per week in the white lead industry in England to one in six months among the German painters. When a worker is discovered with symptoms of plumbism, the laws almost universally require that he be "suspended;" that is, given employment that keeps him out of contact with lead until he has fully recovered. Belgium requires that a leaded man be kept out of that sort of work permanently.

A decisive clause found only in the German law, but there repeatedly, is that workers continually violating the hygienic rules set up, shall, after repeated warning, be summarily and permanently discharged. A similar but much weaker clause is the occasional English provision that a reckless worker lays himself open, upon conviction, to a fine. In Belgium no workman addicted to alcohol may legally be employed in white lead, lead oxide, or lead paint making.

Three of the countries considered — Germany, France and Belgium — have turned their attention to house painting, a pro-

lific source of painful and annoying, but less often fatal variety of lead poisoning. Among other regulations all three of these countries forbid the removal of lead paint by any dry rubbing or scraping process. On August 20, 1909, Belgium decided that after the expiration of one year white lead for painting purposes could only be transported, sold, or used in the form of a paste or liquid mixed with oil, and the ministry was given power to extend the same prohibition to white lead for any other purpose. By an act of 1909, however, France has put itself far beyond this, having decreed that after July 20, 1914, the use of "white lead, of linseed oil mixed with white lead, and of all specialized products containing white lead, will be forbidden in all painting, no matter of what nature, carried on by working painters either on the outside or in the inside of buildings."

Of the industries considered which include all the more important ones using lead, those in which the health of workers has been made a matter of legislative treatment in Germany are: casting, zinc smelting, type founding and stereotyping, type setting, white lead manufacturing, other lead oxides, paints and dyes, electric accumulators, painting and file cutting. England has taken up lead smelting and casting, type founding, white lead, lead oxides and paints, electric accumulators, file cutting, heading yarn dyed with a lead compound, earthenware and china, and the painting of same, and turning and enamelling. France has dealt with the mining, smelting, white lead, lead oxides and paints, electric accumulators, painting, the pottery processes and enamelling. Belgium's attention has been given to lead smelting, white lead and oxides, electric accumulators, painting, and particularly to china, porcelain and faience.

THE PRINCIPAL LEAD INDUSTRIES AND DATES OF PRESENT  
LEGISLATION THEREON IN FOUR LEADING EUROPEAN  
COUNTRIES.

INDUSTRY	England	Germany	France	Belgium
Lead mining.....	1898	1892	1893	1810, 1892, 1894
Lead smelting and casting.....	1901, 1911	1893 1905	1893, 1904 1905, 1908	1898, 1901, 1905
Zinc smelting.....	.....	1900	.....	.....
Typefoundry and stereotyping.....	1901	1897 1907, 1908	.....	.....
Typesetting.....	.....	1897, 1907 1908	.....	.....
White lead.....	1898	1903	1908, 1909	1892, 1894, 1898 1899, 1902, 1905
Other lead oxides, paints and dyes.....	1898, 1907 1911	1903	1893, 1908 1909	1892, 1894, 1898 1899, 1902, 1905
Electric accumulators.....	1903	1908	1908, 1909	1894, 1898
Industries using paint containing lead.....	.....	1905	1902, 1904 1909	1905, 1909
File cutting.....	1903	1908	.....	.....
Heading yarn dyed with lead compound.....	1907	.....	.....	.....
Earthenware and China.....	1901, 1903	.....	1909 1902, 1908	1899, 1905, 1908 1889, 1892, 1898
Color transfers on earthenware and china.....	1898	.....	1908, 1909	1889, 1892, 1898 1899, 1905, 1908
Tinning and enameling.....	1894	.....	1908, 1909	.....

COMPARATIVE ANALYSIS OF LEGISLATION RELATING TO LEAD POISONING IN ENGLAND, GERMANY, FRANCE  
AND BELGIUM.

INDUSTRY	ENGLAND	GERMANY	FRANCE	BELGIUM
LEAD MINING.		Applies only to women (1892). No more than 8 hours per shift. Not earlier than 5 A. M. Not later than 10 P. M. One-half hour pause between 2d and 6th hour. Women between 16 and 18 only on medical certificate of fit- ness. Posted notice of law.	Employment of women and children forbidden.	
LEAD SMELTING AND CASTING.	One-half hour's rest after every 2 hours work (1898).  No person under 16. No females employed.  Clothes closets. Lunch rooms unless works close during meal hours. Washing and dressing rooms. Wash water. Soap. Towels. Nailbrushes. Warm baths.  Must wash before eating. Must wash before leaving fac- tory.  No food in factory.  No alcoholic drink in work place. No tobacco in work place (1901).	4-8-10 hours, depending on oc- cupation.  No young persons employed. No females employed.  Clothes closets.  Lunch rooms.  Washing and dressing rooms. Wash water. Soap. Towels.  Warm baths. Drinking water. Must wash before eating.  Must wash before leaving fac- tory.  No food in work room.  No smoking in work place.	10 hours per day.  No person under 18. No women.  Clothes closets.  Washing and dressing rooms. Wash water. Soap. Towels.  Warm baths.  Must wash before eating. No food in work room.  No drink in work room.  Gloves. Respirators.	10 hours per day: 8 hours for children under 16.  No person under 14. No women under 21 years (1901). Cloak rooms.  Wash rooms. Wash water.  Drinking water.  No food in places used for handling poisonous mate- rials.

COMPARATIVE ANALYSIS OF LEGISLATION RELATING TO LEAD POISONING IN ENGLAND, GERMANY, FRANCE  
AND BELGIUM —(Continued).

INDUSTRY	ENGLAND	GERMANY	FRANCE	BELGIUM
LEAD SMELTING AND CASTING.—(Continued.)	Respirators. Overalls. Medical inspection monthly (1901). Men with lead symptoms re- moved from lead work (1911).	Gloves, respirators, overalls, cap. Medical inspection monthly. Men with lead symptoms re- moved from lead processes.	Overalls. Posted notice of law. Lead substances to be kept moist.	Shall wear a working garment Prevention of noxious gases from spreading in shop.
	Health register (1911). Posted notice of law (1901). Hoods on dust producing ma- chinery (1901).	Health register. Posted notice of law. Employer to instruct men. Lead substances to be kept moist. Hoods on dust producing ma- chinery.	Hoods on dust producing ma- chinery. 7 cubic meters air space per worker. Sufficient ventilation.	10 cubic meters air space per worker (1905).
	Dust removing mechanism.	Sufficient height and air space. Sufficient ventilation. Dust removing mechanism.	Dust removing mechanism. Floors inclined toward water- tight reservoir. Tables, walls and floors washed weekly.	Suitable ventilation. Sufficient lighting.
		Floors cleaned once a day in moist state. Walls smooth. Walls washed once a year or whitewashed. Medical certificate that worker is fit for the work (1905).		All harmful debris cleared away daily. Sweeping in such a way as to prevent dust, and if pos- sible out of working hours.

COMPARATIVE ANALYSIS OF LEGISLATION RELATING TO LEAD POISONING IN ENGLAND, GERMANY, FRANCE  
AND BELGIUM — (Continued).

INDUSTRY	ENGLAND	GERMANY	FRANCE	BELGIUM
ZINC SMELTING.		<p>Young people between 16 and 18 forbidden in certain work about the furnaces. May be employed in other work upon medical certificate of fitness.</p> <p>10 hours per day. No person under 14. No women under 21. Cloak rooms. Wash rooms. Wash water. Drinking water. No food in places used for handling poisonous materials.</p> <p>Shall wear a working garment. Prevention of noxious gases from spreading in shop. 10 cubic meters air space per worker. Suitable ventilation. Sufficient lighting. All harmful debris cleared away daily.</p> <p>Sweeping in such a way as to prevent dust, and if possible out of working hours.</p>		
TYPE FOUNDRY AND STEREOTYPING	<p>Women, young persons or children must not take meals or remain during meal time in room where typefounding is carried on.</p>	<p>Clothes closets. Young persons must not clean type cases. Wash water. Soap. Towels. Must wash before leaving factory.</p>		

COMPARATIVE ANALYSIS OF LEGISLATION RELATING TO LEAD POISONING IN ENGLAND, GERMANY, FRANCE  
AND BELGIUM —(Continued).

INDUSTRY	ENGLAND	GERMANY	FRANCE	BELGIUM
TYPE FOUNDRY AND STEREOTYPING—(Continued.)		<p>No food in work room. Posted notice of law. Hoods and exhausts on melting pots. 12 to 15 cubic meters air space per worker. Sufficient light. Walls, shelves, etc., thoroughly cleaned twice a year. Hard, non-porous walls and floor. Walls and ceilings paneled, painted or else whitewashed yearly (1897, 1907, 1908).</p>		
TYPESETTING.		<p>12 cubic meters air space per worker. Clothes closets. Young persons must not clean typecases. Wash water. Soap. Towels. Must wash before leaving factory. No food in work room. Posted notice of law. Hoods and exhausts on melting pots. 12 to 15 cubic meters air space per worker. Sufficient light. Walls, shelves, etc., thoroughly cleaned twice a year. Hard, non-porous walls and floors.</p>		



COMPARATIVE ANALYSIS OF LEGISLATION RELATING TO LEAD POISONING IN ENGLAND, GERMANY, FRANCE  
AND BELGIUM — (Continued).

INDUSTRY	ENGLAND	GERMANY	FRANCE	BELGIUM
TYPESETTING. — (Continued.)		Walls and ceilings paneled, painted or else whitewashed yearly.		
WHITE LEAD.	<p>"No person shall be employed in drawing Dutch stoves on more than two days in any week."</p> <p>No women in any work exposing to white lead dust. Clothes closets.</p> <p>Dining room or kitchen.</p> <p>Wash room.</p> <p>Wash water.</p> <p>Soap.</p> <p>Towels.</p> <p>Nailbrushes.</p> <p>Warm baths; bath register. 10 minutes allowed for washing.</p> <p>No food in work rooms.</p> <p>No drink in work rooms.</p> <p>No tobacco in any form in work rooms.</p> <p>Respirators.</p> <p>Overalls.</p> <p>Head covering.</p>	<p>8 hours per day; 10 for those not working in corroding beds or at packing.</p> <p>1 hour rest after 2 hours' work. No young persons under 18.</p> <p>Women if not exposed to dust or vapors.</p> <p>Clothes closets.</p> <p>Lunch room.</p> <p>Washing and dressing room.</p> <p>Wash water.</p> <p>Soap.</p> <p>Towels.</p> <p>Nailbrushes.</p> <p>Baths.</p> <p>Must wash before eating.</p> <p>Must wash before leaving factory.</p> <p>No food in work rooms.</p> <p>No alcoholic drink in factory.</p> <p>No smoking, chewing or snuffing during work.</p> <p>Gloves or gresse.</p> <p>Respirators, sponges.</p> <p>Working clothes.</p>	<p>10 hours per day.</p> <p>No person under 18.</p> <p>No women.</p> <p>Clothes closets.</p> <p>Washing and dressing room.</p> <p>Wash water.</p> <p>Soap.</p> <p>Towels.</p> <p>Warm baths.</p> <p>Must wash before eating.</p> <p>No food in work room.</p> <p>No drink in work room.</p> <p>Gloves.</p> <p>Respirators.</p> <p>Overalls.</p>	<p>10 hours per day; 8 hours for children under 16.</p> <p>No person under 14.</p> <p>No women under 21 years (1901).</p> <p>Cloak rooms.</p> <p>Drinking water.</p> <p>No food in places used for handling poisonous materials.</p> <p>Shall wear a working garment.</p> <p>Prevention of noxious gases from spreading in shop.</p> <p>10 cubic meters air space per worker (1905).</p>

COMPARATIVE ANALYSIS OF LEGISLATION RELATING TO LEAD POISONING IN ENGLAND, GERMANY, FRANCE  
AND BELGIUM —(Continued).

INDUSTRY	ENGLAND	GERMANY	FRANCE	BELGIUM
WHITE LEAD.—(Continued.)				
	Medical inspection weekly. Men with lead symptoms to be removed from lead work.	Medical inspection twice monthly. Men with lead symptoms removed from lead work.	Posted notice of law. Lead substances to be kept moist.	Suitable ventilation. Sufficient lighting. All harmful debris cleared away daily. Sweeping in such a way as to prevent dust, and if possible out of working hours. Soap, towels, nailbrushes, sand. Must wash and take off work-clothes before eating. Mask, respirators or handkerchiefs with moist sponges Medical inspection monthly.
	Health register.	Discharge of men violating rules after warning.	Hoods on dust producing machinery.	Men with lead symptoms removed permanently; all others ill removed until recovery.
	Hoods and exhausts on dust producing machinery.	Health register. Posted notice of law. Employers to instruct men. Lead material to be kept moist.	7 cubic meters air space per worker.	Men addicted to alcohol not to be employed. Health register. Lead dust to be kept moist.
	Thorough ventilation.	Hoods on dust producing machinery.	Sufficient ventilation.	Hoods on dust producing machinery.
	Exhaust fans.	Rooms guarded against entry of dust or vapor.	Dust removing mechanism.	Walls and woodwork washed weekly.

COMPARATIVE ANALYSIS OF LEGISLATION RELATING TO LEAD POISONING IN ENGLAND, GERMANY, FRANCE  
AND BELGIUM—(Continued).

INDUSTRY	ENGLAND	GERMANY	FRANCE	BELGIUM
WHITE LEAD.—(Continued.)	<p>Floor of each work room cleaned daily after dampening.</p> <p>No person shall be employed more than a week without certificate (medical) of fitness.</p>	<p>Rooms spacious and high.</p> <p>Sufficient light.</p> <p>Thorough ventilation.</p> <p>Walls cleaned with hose before oxidising chambers are refilled.</p> <p>Walls smooth.</p> <p>Mechanical means in transport, washing and grinding of white lead (and mixing with oil, 1905).</p> <p>Employment only of persons provided with medical certificate of fitness (1903).</p>	<p>Floors inclined toward watertight reservoir.</p> <p>Tables, walls and floors washed weekly.</p>	<p>Floors washed with water or sand daily.</p> <p>Mechanical means for crushing white lead; also outside of corroding beds; for separating corroded from non-corroded portions; also for transport of white lead from process to process.</p>
LEAD OXIDES, PAINTS AND DYES.	<p>No person under 16 (1911).</p> <p>No women (1911). Clothes closets. Lunch room. Wash rooms. Wash water (hot).</p>	<p>8 hours per day; 10 for those not working in corroding beds or at packing.</p> <p>1 hour free after 2 hours' work.</p> <p>No young person under 18.</p> <p>Women, if not exposed to dust or vapors.</p> <p>Clothes closets. Lunch room.</p>		<p>10 hours per day; 8 hours for children under 16.</p> <p>No person under 14. No women under 21. Cloak rooms. Wash rooms. Wash water.</p>

COMPARATIVE ANALYSIS OF LEGISLATION RELATING TO LEAD POISONING IN ENGLAND, GERMANY, FRANCE  
AND BELGIUM — (Continued).

INDUSTRY	ENGLAND	GERMANY	FRANCE	BELGIUM
LEAD OXIDES, PAINTS AND RESINS. — (Continued.)	<p>Soap. Towels. Nailbrushes. Warm baths. Sanitary drink and Epsom salts (1898). Must wash before leaving factory. No food in work place. No alcoholic drink in work place. No tobacco in work place. Respirators.</p> <p>Overalls. Medical inspection monthly. Men removed from lead work when having symptoms of lead poisoning.</p> <p>Health register (1898). Posted notice of law (1901).</p>	<p>Washing and dressing room. Wash water. Soap. Towels. Nailbrushes. Baths. Must wash before eating. Must wash before leaving factory. No food in work rooms. No alcoholic drink in factory. No smoking, chewing or snuffing during work. Gloves or grease. Respirators, sponges.</p> <p>Working clothes. Medical inspection twice monthly.</p>		<p>Drinking water. No food in places used for handling poisonous materials.</p> <p>Shall wear a working garment. Prevention of noxious gases from spreading in shop.</p> <p>10 cubic meters air space per worker. Suitable ventilation. Sufficient lighting. All harmful debris cleared away daily. Sweeping in such a way as to prevent dust, and if possible out of working hours. Walls and wood work washed weekly. Floors washed with water or sand daily.</p>

COMPARATIVE ANALYSIS OF LEGISLATION RELATING TO LEAD POISONING IN ENGLAND, GERMANY, FRANCE  
AND BELGIUM — (Continued).

INDUSTRY	ENGLAND	GERMANY	FRANCE	BELGIUM
LEAD OXIDES, PAINTS AND DYES. — (Continued.)	Hoods and exhaust fans over dusty processes (1898).	Men with lead symptoms re- moved from lead work. Discharge of men violating rules after warning. Health register. Posted notice of law. Employers to instruct men. Lead material to be kept moist. Hoods on dust producing ma- chinery. Rooms guarded against entry of dust or vapor. Rooms spacious and light. Sufficient light. Walls cleaned with hose before oxidizing chambers are re- filled. Walls smooth. Mechanical means in transport washing and grinding of white lead. Employment only if provided with medical certificate of fitness.		Hoods on dust producing ma- chines. Furnaces in open air or in places energetically venti- lated.
ELECTRIC ACCUMULATORS.	In manipulation of dry com- pounds of lead or in pasting no child, no young person, no woman.	8 hours per day, with break of 1½ hours, or 6 hours per day uninterrupted	10 hours per day. No person under 18.	No person under 14 (1898). No women.

COMPARATIVE ANALYSIS OF LEGISLATION RELATING TO LEAD POISONING IN ENGLAND, GERMANY, FRANCE  
AND BELGIUM —(Continued).

INDUSTRY	ENGLAND	GERMANY	FRANCE	BELGIUM
ELECTRIC ACCUMULATORS.—(Cont'd.)	<p>Lunch room. Clothes closets. Wash room, 10 min. allowed. Wash water. Soap. Towels. Nailbrushes. Warm bath. Must wash before meals. Wash before leaving factory.</p> <p>No food in work rooms. No drink in work rooms. No tobacco in work rooms.</p> <p>Overalls. Medical inspection monthly. "Supervision of men with lead symptoms from contact with lead." Health register. 500 cubic feet air space per worker. Windows made to open for thorough ventilation.</p>	<p>In departments where lead is used, no young persons, no women. Clothes closets. Wash and dressing room. Wash water. Vessels for rinsing mouth. Soap. Towels. Handbrushes.</p> <p>Warm bath.</p> <p>Must wash before meals. Wash before leaving factory. No food in work rooms. No alcoholic drink in work rooms. No smoking, chewing or snuffing in work rooms. Overalls. Caps.</p> <p>Medical inspection monthly. Men with lead symptoms removed from lead. Men acting contrary to rules after warning to be discharged. Health register. Posted notice of law. Rooms 3 metres high. Sufficient number of windows for ventilation.</p>	<p>No women. Clothes closets. Washing and dressing rooms. Wash water. Soap. Towels. Warm baths. Must wash before eating. Must wash before leaving factory. No food in work room. No drink in workroom. Gloves. Respirators.</p> <p>Overalls. Posted notice of law.</p> <p>Lead substances to be kept moist.</p>	

COMPARATIVE ANALYSIS OF LEGISLATION RELATING TO LEAD POISONING IN ENGLAND, GERMANY, FRANCE  
AND BELGIUM —(Continued).

INDUSTRY	ENGLAND	GERMANY	FRANCE	BELGIUM
ELECTRIC ACCUMULATORS—(Contd.)	Hoods over machinery. Exhaust drafts and shafts. Floors washed daily with hose. Employment only upon medical certificate of fitness. (1903).	Hoods over machinery. Exhaust fans and pipes. Walls whitewashed once a year unless washably paneled or painted. Floors smooth, water-proof wood, soft asphalt, linoleum not allowed. Employment only upon medical certificate of fitness. (1908).	Hoods on dust producing machinery. 7 cubic meters air space per worker. Sufficient ventilation. Dust removing mechanism. Floors inclined toward watertight reservoir. Tables, walls and floors washed weekly.	
INDUSTRIES USING PAINT CONTAINING LEAD.		Clothes closets. Wash and dressing rooms. Wash water. Soap. Towels Nailbrushes. Must wash before meals. No food in work room.	"Necessary facilities for cleanliness." Overalls in all moist scraping off and in painting with white lead. Employers must hang text of law in work places and where men receive wages. Scraping off of white lead paint by the dry method is forbidden. White lead only used in pasty condition. Manipulating with bare hands any material containing white lead forbidden. All tools kept clean.	Wash water. Soap. Towels. Means to rinse mouth Wash before meals. Wash before leaving shop. Food brought in to be in tight packages.

COMPARATIVE ANALYSIS OF LEGISLATION RELATING TO LEAD POISONING IN ENGLAND, GERMANY, FRANCE  
AND BELGIUM —(Continued).

INDUSTRY	ENGLAND	GERMANY	FRANCE	BELGIUM
<p>INDUSTRIES USING PAINT CONTAINING LEAD.—(Continued.)</p>		<p>No alcoholic drink in work room. No tobacco during work. Overalls. Caps. Medical inspection every six months. Lead man removed to occupation where no contact with lead. Men breaking regulations after warning to be discharged. Health register. Employers must indicate to workmen the dangers. Employers must hand copy of the regulations. "The rubbing off of dry paint which cannot be proved to be free of lead must only be done after previous moistening" (1905.)</p>	<p>Cleaning must not be done in dry state. After July 20, 1914, "the use of white lead, of linseed oil mixed with lead and all specialized products containing white lead will be forbidden by law in all painting, no matter of what nature carried on by working painters either on the outside or inside of buildings." (1909.)</p>	<p>No alcoholic drink in shop. Work clothing and head covering. Medical inspection every 3 months. No men addicted to alcohol to be employed. Health register. Dry working, scraping or rubbing of white lead surfaces forbidden. Mixing, grinding, manipulation etc. of white lead or other lead compounds forbidden except when in such way that workers do not come in contact with lead with their hands (1905). After August 20, 1910, "the sale, transportation, or use of white lead in powder, grains or cakes intended for painting is forbidden." For this purpose white lead may only be sold, transported or used in form of paint mixed or ground in oil (1909).</p>
<p>FILE CUTTING.</p>	<p>Washing conveniences. Wash water. "A long apron reaching from the shoulders and neck to below the knees." Posted notice of law. 350 cubic feet for every "stock." Efficient inlet and outlet ventilation. Walls and ceilings lime-washed every 6 months.</p>	<p>Must wash with soap or pumice stone before eating. Same before leaving shop. No smoking, chewing or snuffing tobacco in work time.</p>		



COMPARATIVE ANALYSIS OF LEGISLATION RELATING TO LEAD POISONING IN ENGLAND, GERMANY, FRANCE  
AND BELGIUM — (Continued).

INDUSTRY	ENGLAND	GERMANY	FRANCE	BELGIUM
FILE CUTTING.—(Continued.)	<p>Floor and benches cleaned every week (1903.)</p> <p>No person under 16 years.</p> <p>Lunch room unless works close at meal time.</p> <p>Wash room.</p> <p>Wash water.</p> <p>Soap.</p> <p>Towels.</p> <p>Nailbrushes.</p> <p>Must wash before eating.</p> <p>Wash before leaving premises.</p> <p>No food in work room.</p> <p>No drink in work room.</p> <p>No tobacco in work room.</p> <p>Overalls.</p> <p>Head covering.</p> <p>Medical inspection every 3 months.</p> <p>"Suspension till recovered" of worker showing lead symptoms.</p> <p>Health register.</p> <p>Efficient exhaust draft (1907.)</p>			
EARTHENWARE AND CHINA.	<p>No person under 15 (except certain processes).</p> <p>Clothes closets.</p> <p>"Suitable provision . . . during meal times."</p> <p>Wash water.</p> <p>Soap.</p> <p>Towels.</p> <p>Nailbrushes.</p> <p>Must wash before meals.</p> <p>Wash before leaving works.</p> <p>No food in work room.</p> <p>No tobacco in work room.</p> <p>No drink in work room.</p>	<p>No person under 15 (except certain processes).</p> <p>Clothes closets.</p> <p>"Suitable provision . . . during meal times."</p> <p>Wash water.</p> <p>Soap.</p> <p>Towels.</p> <p>Nailbrushes.</p> <p>Must wash before eating.</p> <p>No food in work room.</p> <p>No drink in work room.</p> <p>Gloves.</p> <p>Respirators.</p>	<p>10 hours per day.</p> <p>No person under 18.</p> <p>No women.</p> <p>Clothes closets.</p> <p>Washing and dressing rooms.</p> <p>Wash water.</p> <p>Soap.</p> <p>Towels.</p> <p>Warm baths.</p> <p>Must wash before eating.</p> <p>No food in work room.</p> <p>No drink in work room.</p> <p>Gloves.</p> <p>Respirators.</p>	<p>10 hours for all under 16, and women 16 to 21.</p> <p>At least 3 pauses, 1½ hours in toto.</p> <p>Midday rest 1 hour (1892).</p> <p>Children under 12 forbidden.</p> <p>Women forbidden for 4 weeks following confinement.</p> <p>Cloak rooms.</p> <p>Drinking water or sanitary drink.</p> <p>Wash rooms.</p> <p>10 cubic meters air space per worker.</p>

COMPARATIVE ANALYSIS OF LEGISLATION RELATING TO LEAD POISONING IN ENGLAND, GERMANY, FRANCE  
AND BELGIUM —(Continued).

INDUSTRY	ENGLAND	GERMANY	FRANCE	BELGIUM
EARTHENWARE AND CHINA.—(Continued.)	For women: respirators, overalls, head covering. Medical inspection monthly for women and young persons. "Suspension" till recovery of those showing lead symptoms. Health register. Exhaust fans for certain processes. Floors and stoves swept daily; other parts weekly. (1901.)		Overalls. Posted notice of law. Lead substances to be kept moist. Hoods on dust producing machinery. 7 cubic meters air space per worker. Sufficient ventilation. Dust removing mechanism. Floors inclined toward water-tight reservoir. Tables, walls and floors washed weekly.	Measures against noxious fumes, dust, etc. Sufficient lighting. "A working garment." No food in places used for handling dangerous materials. All harmful debris cleaned away daily. (1905.)
COLOR TRANSFERS ON EARTHENWARE AND CHINA.	No person under 15. Clothes closets. "Suitable provision during meal times." Washing conveniences. Wash water. Soap. Towels. Nailbrushes. No food in work places. No drink in work places. For women and young persons: overalls, head covering. Medical inspection monthly. "Suspension" of those showing lead symptoms. Health register. Exhaust fans.		10 hours per day. No person under 18. No women. Clothes closets. Washing and dressing rooms. Wash water. Soap. Towels. Warm baths. Must wash before eating. No food in work room. No drink in work room. Gloves. Respirators. Overalls. Posted notice of law. Lead substances to be kept moist. Hoods on dust producing machinery. 7 cubic meters air space per worker. Dust removing mechanism.	10 hours for all under 16, and women 16 to 21. At least 3 pauses, 1½ hours in toto. Midday rest 1 hour. Children under 12 forbidden. Women forbidden for 4 weeks following confinement. Cloak rooms. Drinking water or sanitary drink. Wash rooms. 10 cubic meters air space per worker. Measures against noxious fumes, dust, etc. Sufficient lighting. "A working garment." No food in places used for handling dangerous materials. All harmful debris cleaned away daily. (1905.)

COMPARATIVE ANALYSIS OF LEGISLATION RELATING TO LEAD POISONING IN ENGLAND, GERMANY, FRANCE  
AND BELGIUM — (Concluded).

INDUSTRY	ENGLAND	GERMANY	FRANCE	BELGIUM
COLOR TRANSFERS ON EARTHENWARE AND CHINA.—(Continued.)			Floors inclined toward water-tight reservoir. Tables, walls and floors washed weekly.	
TINNING AND ENAMELING.	Clothes closets. Wash room. Wash water. Exhaust fans. Soap. Towels. Nailbrushes. Must wash before meals. Must wash before leaving shop. No food in shop. Respirators. Overalls. Head coverings. Medical inspection monthly. Sanitary drink. Medical certificate from all women, or persons out because of illness (1894.)		10 hours per day. No person under 18. No women. Clothes closets. Washing and dressing rooms. Wash water. Soap. Towels. Warm baths. Must wash before eating. No food in work room. No drink in work room. Gloves. Respirators. Overalls. Posted notice of law. Lead substances to be kept moist. Hoods on dust producing machinery. 7 cubic meters air space per worker. Sufficient ventilation. Dust removing mechanism. Floors inclined toward water-tight reservoir. Tables, walls and floors washed weekly.	

## CHAPTER III

### INDUSTRIES IN WHICH LEAD IS USED.

*The results of a special inspection of factories in these industries.*

The fact which above all others makes the subject of lead in industry and lead poisoning so important is its very wide diffusion through the industrial field. Dr. Thomas Oliver states that no less than 138 industries use lead in some form. While the writer, in the short time at his disposal, has been unable to find the evidence of lead in so many industries, and much less to inspect so many lines of industry — there are certain industries in New York State which employ lead in their manufacturing processes. For the purpose of this study, these industries may be grouped under certain main heads.

#### A. MANUFACTURING INDUSTRIES.

##### I. (a) Manufacture of hydrated carbonate of lead, or white lead.<sup>1</sup>

- (1) Old Dutch process.
- (2) Quick, or Carter process.
- (3) Matheson process.

##### (b) Manufacture of lead oxide.

- (1) Red lead.
- (2) Lead litharge.

##### (c) Manufacture of lead acetate, or sugar of lead.

##### II. Manufacture of paint and colors.

- (a) Oil colors.
- (b) Dry colors.
- (c) Dyes and chrome colors, especially chrome dyes.
- (d) Enamels.

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<sup>1</sup> The term "carbonate of lead" or "lead carbonate" will be used for sake of abbreviation.

## III. Smelting, melting, refining and casting of lead.

- (a) Refining of lead junk.
- (b) Manufacture of lead alloys, type metal, Babbitt metal, etc.
- (c) Manufacture of solder.
- (d) Manufacture of calin (lead tin.)

## IV. Use of lead as a hardening agent.

## V. Use of lead solders.

- (a) Manufacture of tin cans.

## VI. Manufacture of pottery.

- (a) Glazing of pottery and earthenware.
- (b) Manufacture of litho-transfers.

## VII. Manufacture of coaches, carriages and automobile bodies.

- (a) Painting and varnishing departments.

## VIII. Enamelling.

- (a) Iron plates.
- (b) Hollow ware.
- (c) Signs.

## IX. Tinning of metals with lead or lead and tin.

## X. Printing.

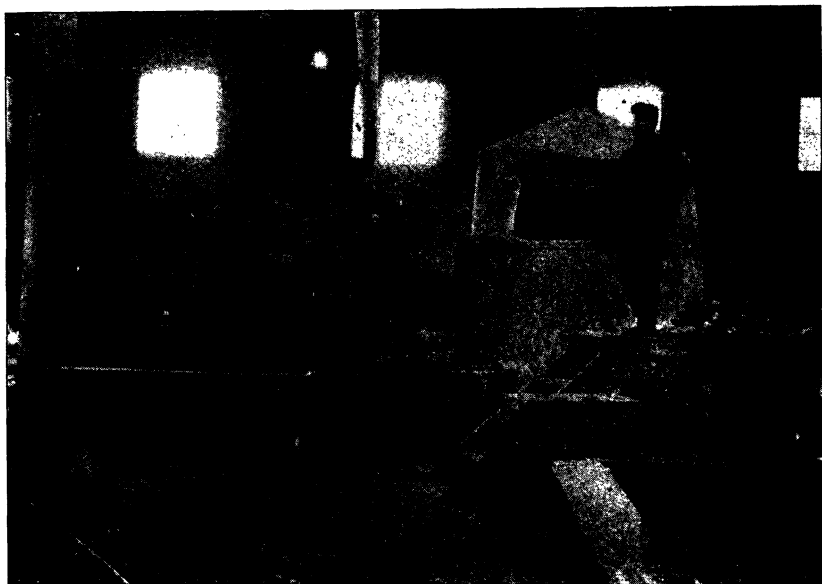
- (a) Stereotyping.
- (b) Linotyping.
- (c) Electrotyping.

## XI. Miscellaneous.

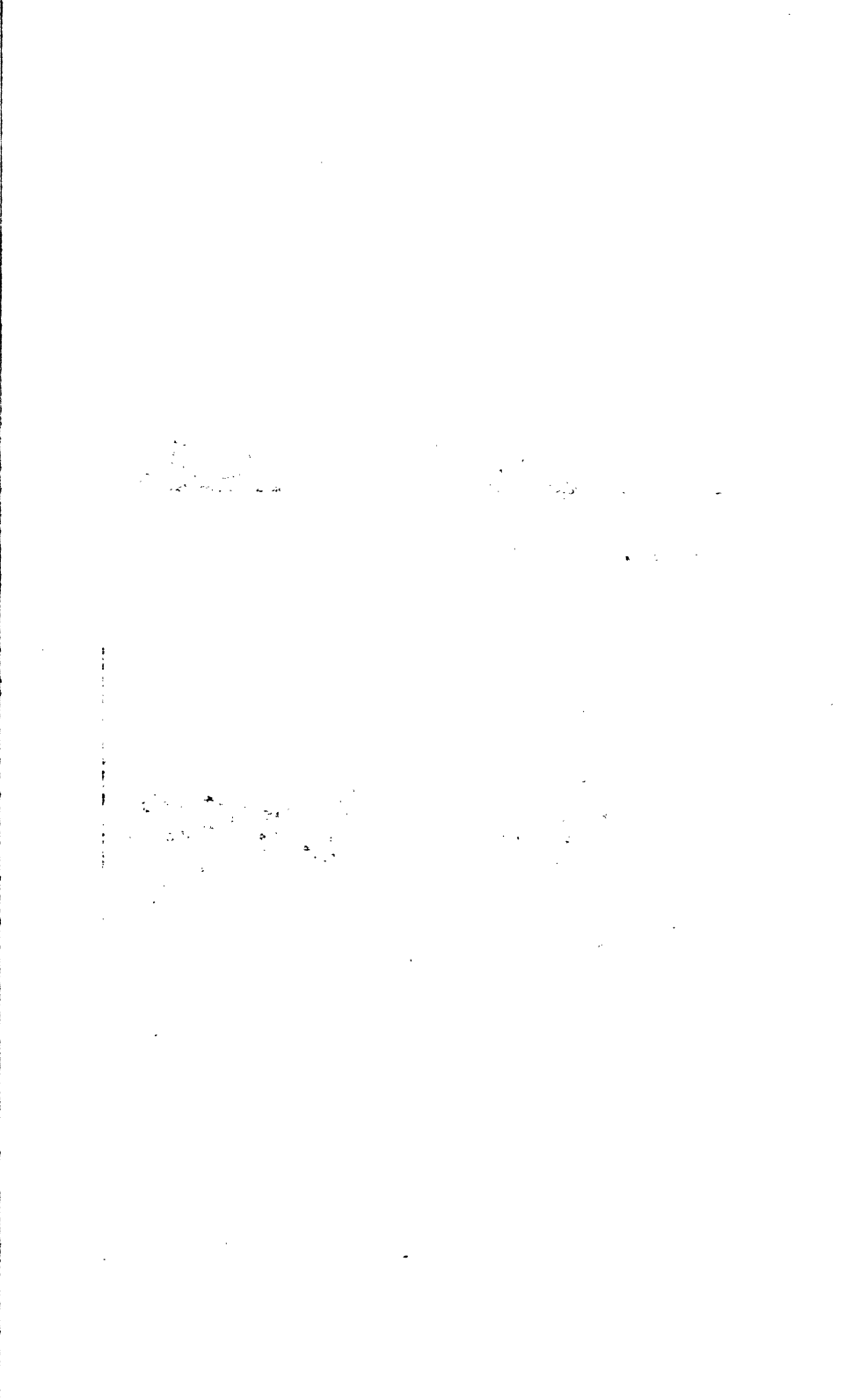
- (1) Manufacture of plumbing fixtures and supplies.
- (2) Manufacture of lead pipe and lead tubing.
- (3) Manufacture of lead wire.

XI. Miscellaneous —(*Continued*).

- (4) Manufacture of sheet lead.
- (5) Manufacture of tinfoil.
- (6) Manufacture of lead foil.
- (7) Manufacture of lead picture frames.
- (8) Manufacture of car seals.
- (9) Manufacture of coffins and coffin hardware.
- (10) Manufacture of storage batteries and storage battery plates.
- (11) Manufacture of sanitary ware.
- (12) Manufacture of tiles.
- (13) Manufacture of glazed bricks.
- (14) Manufacture of metal caps for bottles.
- (15) Manufacture of lead chromate.
- (16) Manufacture of electric accumulators.
- (17) Manufacture of linoleum and oilcloth.
- (18) Manufacture of embroidery.
- (19) Manufacture of putty.
- (20) Manufacture of white rubber.
- (21) Manufacture of shot.
- (22) Painting of cars and agricultural implements.
- (23) Brass founding and polishing.
- (24) Glass cutting.
- (25) Type foundries.
- (26) File cutting.
- (27) Diamond polishing.
- (28) Calico printing.
- (29) Shoe finishing and staining by lead compounds.
- (30) Chromo-lithographic works.
- (31) Lead mining.
- (32) Harnessmaking.



No. 1.— FACTORY A — WHITE LEAD. Melting pig lead and casting into buckles.





## B. NON-MANUFACTURING INDUSTRIES.

- I. Painting and decorating, especially interior work.
- II. Plumbing.
- III. Gas fitting.
- IV. Commercial and mechanical artists and retouchers.

This list, imposing and varied as it is, doubtless falls far short of being exhaustive. Almost every day of the investigation revealed some new industry where one would never have expected to find the use of lead.

It is impossible to state either in how many factories lead is used in one of its many forms, or how many persons in the course of their daily work come in contact with this poisonous metal. In preparation for this report 50 special inspections were made. The object of these inspections was not so much to determine conditions of ventilation, sanitation, cleanliness, safety, etc., primarily (this was being done by another division of the Commission's staff), but to study the processes of manufacture with a view to finding out and determining the dangers of poisoning to which the workers are exposed, and also with a view to making such recommendations as may eliminate or minimize the dangers.

I. MANUFACTURE OF LEAD CARBONATE (WHITE LEAD), LEAD OXIDE (RED OR YELLOW LEAD), ETC.:

There are but four factories manufacturing white, red and yellow lead, and lead acetate in New York city. Each of these has been inspected, and the reports on each are here given in full. Of all the varied forms in which lead is found in manufacturing industries, these are the sources of greatest danger. Three of these factories manufacture the white lead, and one red and yellow lead and lead acetate,—one of the white lead factories makes small quantities of red and yellow lead. In none of these factories are conditions bad. In fact, on the contrary, the condi-

tions are very good. Efforts are being made, sometimes in the face of difficulties, to safeguard and protect the workers. In spite of good conditions, however, the rate of lead poisoning is high.

### *Factory A.*

#### Manufacture of White and Red Lead, and Lead Litharge.

This factory is a collection of several buildings, most of them recently built and in good repair. About 100 men are employed, who are mostly foreigners,—Italians, Slavs, Poles and Hungarians,—speaking English only slightly and with considerable difficulty. The work is almost entirely unskilled and the workers form our lowest industrial strata. The employer and his superintendent were courteous and placed every facility at the command of the inspector. The firm prides itself on the conditions in the plant, and does many things that it thinks will protect and safeguard an industry which is known to be a dangerous one.

#### *I. Manufacture of white lead:*

1. The casting of the buckles.—The lead arrives at the plant in the form of lead pigs. It is then melted and mechanically run into molds, making small, thin, circular, disks perforated in such a way as to resemble buckles, and this is the name by which they are known. The furnace (see photo No. 1) is set in a large, very well ventilated shed,—in fact its sides are almost entirely open. The furnace itself is well hooded and a chimney carries off the fumes. The molten metal runs onto an endless chain of molds, where it quickly solidifies and is dumped into an awaiting car to be taken to the corroding beds.

2. The corroding beds. The old Dutch process.—It is in the corroding beds that the principal chemical process of transforming metallic lead into white lead takes place. In spite of the fact that chemists have been working for years to find a short process, the old Dutch process still produces, according to the manufacturers, the best, and some say, the only white lead. In this factory the corroding beds are housed in an immense structure, tightly enclosed on all sides, with only a few small windows near the roof,



No. 2.— FACTORY A — WHITE LEAD. Stripping the corroding beds.

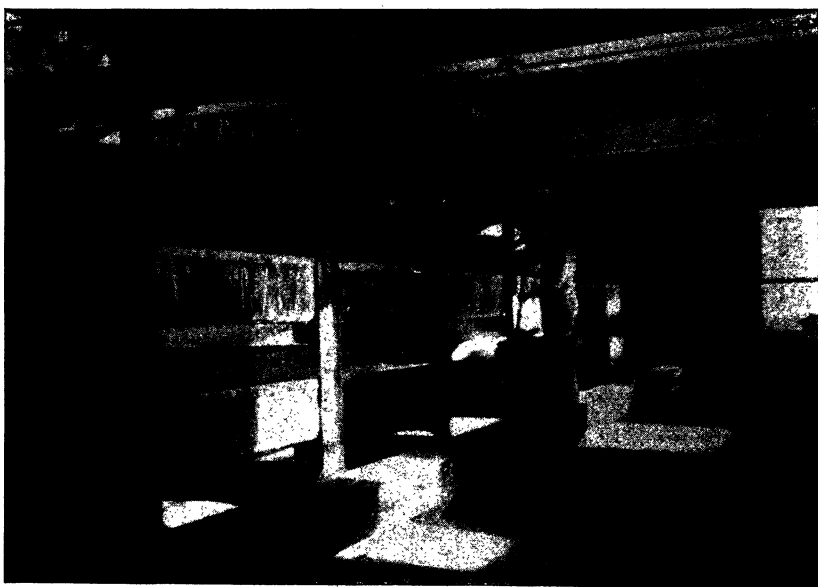


No. 2-b.— FACTORY A — WHITE LEAD. Stripping the corroding beds.





No. 3.— FACTORY A — WHITE LEAD. Feeding corroded buckles into the separators.



No. 4.— FACTORY A — WHITE LEAD. Drying room — open drying pans.



and with little ventilation. The process, mechanically, is a simple one. The floor of a given bed (about 20 by 20) is covered with a layer of tan bark (oak bark being generally used), to a thickness of about 14 inches. On this are placed, as closely as possible, earthenware jars containing about one pint of acetic acid,  $2\frac{1}{2}$  per cent solution. Into this jar are stuffed the lead buckles; they do not enter the acid, for the jar, which is narrowed at the bottom, prevents this. A layer of boards is laid over the jars and another thickness of tan bark is added, more jars, and so on up to a height of 15 to 20 feet.

The stack remains thus for about 100 days. It reaches a temperature, from the heat generated entirely within the corroding bed, of from 120 to 180 degrees Fahrenheit.

At the end of that time, corrosion is supposed to have taken place, and the "stripping of the beds" then takes place. This process is accompanied by considerable risks, and in England the most serious lead poisoning cases have occurred in this work. The upper layer of boards is removed, exposing the pots full of a brittle, white material, in the shape of the original buckles, but having lost the ordinary appearance of metallic lead. This is lead carbonate. A corrosion, of from 40 to 80 per cent takes place; 70 per cent is considered good. Men enter the bed, take up the jars and dump the contents into a small car which stands nearby. (See photos No. 2 and No. 2b.) More or less pure white lead dust always rises in this process. The men are provided with bandana handkerchiefs which they tie about their noses and mouths. The firm provides cheesecloth and sponges for this purpose. Respirators which were provided were refused by the men, who said that these irritated their faces. A traveling crane carries off the car, when full, to a track where it is sent on its way to the separating machines.

3. The car containing the corroded buckles is delivered to the separating machines, and there a worker shovels the white lead from the car into the machine. Although the mouth of the separating machine is protected by a hood, this is one of the most dangerous processes in the factory. (See photo No. 3.) The worker stands constantly over a rising cloud of white lead dust.

He is protected by the usual device, a bandana handkerchief. This work is carried on in a poorly ventilated, dark basement.

The separating of the lead carbonate from the original lead is done by machinery which is enclosed throughout, and hence not especially dangerous in itself to the workers. This process removes the corroded portions of the lead and rejects the uncorroded parts. The rooms in which this work was done were fairly clean, although there was a considerable deposit of white lead on the floors and walls.

The next form in which the lead appears is in solution of white lead and water. In this form it is not especially dangerous. The solution of lead is run into basins where it is stirred gently, and the lighter and finer lead particles are run off over a sort of dam and then through a very fine mesh screen, which eliminates any gross particles.

4. The drying room—The solution of lead and water is pumped to the drying room, where it is deposited in long shallow vats which are arranged in two tiers, one above the other. The temperature of these vats is raised and the solution gives off constant vapors. The ventilating system here is excellent. Two large fans in one end of the room, carry out the air, changing it every three minutes, according to contract with the ventilating firm, and windows and doors are numerous. When the lead has well dried out it is shoveled out into an automatic conveyor which carries it out to the grinding and mixing machines.

The workers in this department (see photo No. 4) are provided with bandana handkerchiefs, and the man seen in the picture claimed that he was in the best of health. The room, however, is a source of danger on account of more or less dust in shoveling, and the temperature taken at the time of inspection was 72 degrees, although several windows were open. The tendency in a superheated room such as this is, of course, to keep the windows tightly closed.

5. Grinding and mixing.—The grinding and mixing work is done entirely by machinery, but the feeding is done by hand, and is especially dangerous. (See photo No. 6.) A car of dry white





No. 6.—FACTORY A — WHITE LEAD. Feeding dry white lead into machines where it is mixed with oil.



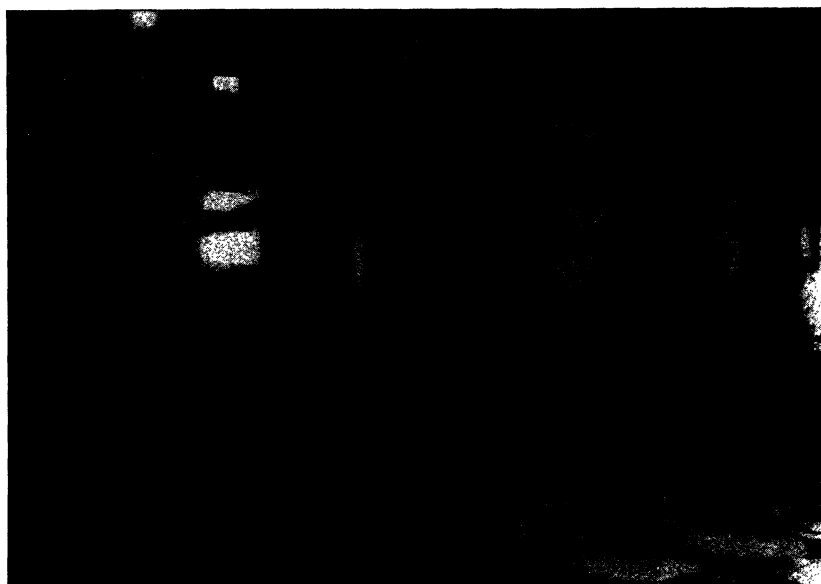
No. 5.—FACTORY A — WHITE LEAD. Exterior of building containing drying pans. The steam can be seen escaping from windows.







NO. 7.—FACTORY A — WHITE LEAD. Filling barrels with dry white lead by machinery.



NO. 8.—FACTORY A — WHITE LEAD. Filling cans with white lead mixed with oil.





No. 9.— FACTORY A — WHITE LEAD. Litharge ovens.



No. 10.— FACTORY A — WHITE LEAD. Exhaust fans from litharge furnaces.



lead is brought to the open mouth of the grinding machine. The worker then shovels it from the car into the machine. The white lead dust is constantly rising about him, and although protected in the ordinary way, his position is a very dangerous one. (See photo No. 6.)

6. Packing.—The lead from this point is ground by machinery and mixed with oil, and comes out of a tube below, the finished product, ready to be put in cans. The only danger in filling the cans (see photo No. 8) is that the white lead, now in a sticky, mushy state, will be conveyed to the mouth by way of the moustache or beard, and hence to the stomach. The workers here permit the lead to run slowly into the cans, which are standing on scales, until it reaches a given weight. The supply is then cut off and the can sealed up and is ready for shipment.

7. Barrel filling.—A certain amount of dry white lead is sent out in barrels. These barrels are filled mechanically, are protected by exhausts, and are covered about by burlap to prevent the escape of dust. (See photo No. 7.) The only danger is from the escape of the lead dust when the barrel is headed up.

## II. *Manufacture of lead oxide — red lead and lead litharge:*

1. The furnaces.—The pig lead is placed in large furnaces, which resemble those in a large bakeshop. The lead is heated to a high temperature and gradually disintegrates and becomes a powder which covers the floor of the oven to a thickness of three or four inches. The worker then rakes this mass backward and forward with a long-handled hoe, called a "ravel," exposing as great a portion of the lead to the air as possible. The heat here is as high as 1800 degrees. The workers do not work continuously, since there is one man to a furnace and a considerable part of the time the furnace is not open. The fumes given off here are dangerous, and are likely to be highly charged with lead oxide, and there is also likelihood of the distribution of red lead dust through the air of the room. The furnaces themselves are provided with powerful exhausts. The hoods connecting with the exhausts extend

for about four feet in front of the worker, protecting him from fumes and dust. (See photos No. 9 and No. 10.)

2. The packing of red lead.—One of the most dangerous jobs in the entire factory was the filling of small kegs with red lead. (See photo No. 11.) The worker stood near a window with an open barrel of red lead powder on his right hand and a scales in front of him, on which was placed a small keg which was to be filled with red lead powder. This he scooped from the barrel with an open scoop and placed slowly in the small keg, until the weight was right. He then headed the keg and repeated the operation. Small clouds of dust could be seen rising on each repetition of the process. The little Italian worker, upon being questioned, stated that he had worked on that job for eight months and “never felt better.” He disclaimed any symptoms of lead poisoning.

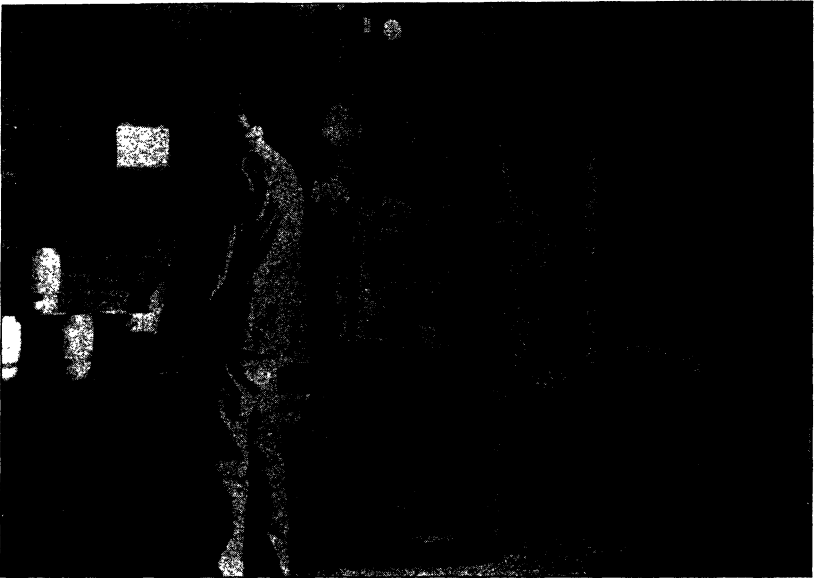
### III. *Provisions for Hygiene:*

The superintendent declared that the firm stood ready and wished to do everything in its power to safeguard the worker against disease. Their works are, as a whole, very well ventilated and well lighted. Conditions are much better on the whole than those in ordinary factories.

Whenever an employee shows signs of being leaded he is at once asked to leave and find employment elsewhere. This may seem hard on the individual worker, but there is no doubt that it accomplishes at least one very desirable end, namely, it removes the individual from what is now an exceptionally dangerous position for him. No physical examinations are made of the men, nor is any track kept of them after they leave the employ of the concern. There is no doctor connected with the establishment.

Throughout the works there are signs calling for “No Smoking.” These signs are printed in three languages,—English, Italian and Polish. One set of instructions concerning the dangers of the work, and precautions to be taken to guard against poisoning, was found. These instructions were, however, printed in English and it may be doubted whether more than ten per cent of the employees could read them.





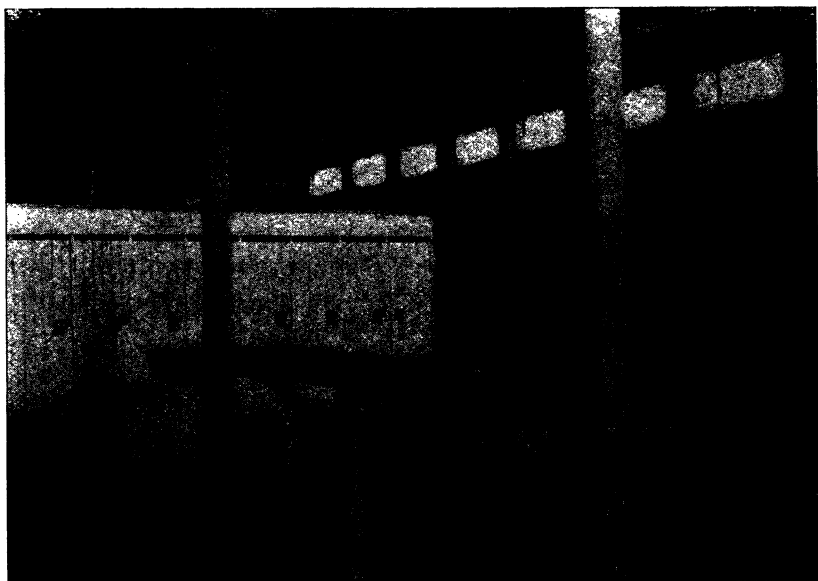
No. 11.—FACTORY A — WHITE LEAD. Very small buckets being filled with powdered red lead.



No. 12.—FACTORY A — WHITE LEAD. Washroom and toilets. The partition at the back conceals a shower bath.

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No. 13.—FACTORY A — WHITE LEAD. Bath and locker rooms. Eight shower baths, tables where lunch may be eaten.





Respirators are furnished the men but they refuse to wear them, saying that they irritate their faces. They do, however, most of them, wear bandana handkerchiefs over their nostrils and mouths. The firm also provides cheesecloth and sponges for the same purpose, but the latter also are not worn by the men.

Each worker is provided with one clean suit of white overalls each week. He is also provided with three clean, coarse, heavy towels per week.

There are several wash rooms throughout the plant and one small building houses a locker room, about a dozen shower baths and a small, rather inadequate lunch room. (See photo No. 13.) The men are compelled to change their clothing and to wash up at the end of the day's work. They are not permitted to eat their lunches in the factory, except in the lunch room provided by the Company. Most of them, as a matter of fact, go to nearby saloons.

Ventilation is good throughout the plant. In the dry room the fans are kept constantly in motion changing the air every three minutes. In other places where there is special need, there are exhausts, as for example, over the red lead ovens. Here the fans on the floor above (see photo No. 10) are powerful and carry away all traces of the fumes, as far as could be detected.

#### IV. *Suggestions for Improvement:*

There are, in addition to the things already being done, certain improvements which would materially lessen the dangers which are still great.

Instructions in the various languages known to the workers, should be distributed throughout the factory and posted in conspicuous places. These instructions should not only warn the workers, but should point out definite things to do in order to safeguard themselves. In addition to, and supplementing this, if some person acquainted with the languages of the various nationalities would personally interview each man and instruct him, much could be accomplished.

Additional lunch-room facilities should be provided, and some kind of hot lunch should be sold. This would tend to keep the men from the nearby saloons, where a large portion of their lunch must be the beer which they buy for the privileges of the saloon.

In the case of the worker filling small kegs with red lead, a slight exhaust would measurably decrease the amount of lead in the atmosphere. This exhaust should be placed facing the worker, and not above him, so that the dust would be drawn away from him and not up in his face.

A similar device could be installed in the case of workers supplying the separators and the grinding and mixing machines.

No doubt a much larger part of the work could be done by machinery, if the plant were a little better arranged and the processes more automatic and continuous.

### FACTORY B.

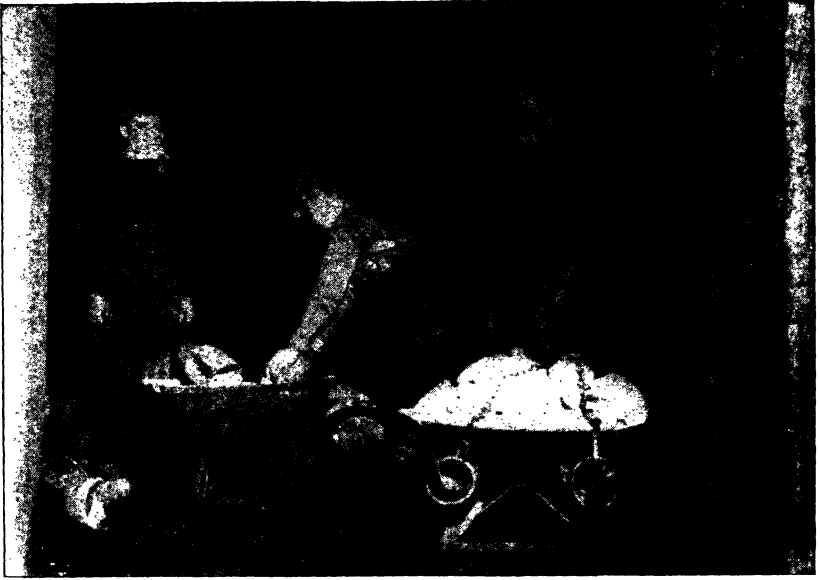
#### I. *Manufacture of White Lead:*

This factory is composed of a number of very old buildings which have been adapted from other purposes to their present uses. It is quite an extensive plant and has a large number of corroding beds where the old Dutch process is used. There are about 330 employees, 3 of whom are women employed in the office. The workers are mainly Italians, Poles, Slavs and Lithuanians.

1. The casting of lead buckles.—The room in which this is done is very dark, so dark, in fact, that gas had to be lighted in order to show the nature of the work done there. The place is ventilated by means of a shaft extending to the roof of the building. The process includes the melting of the pig lead and an endless chain of molds which passes under a stream of the molten metal. The lead hardens before it reaches the end of the chain and is thrown off into an awaiting cart.

2. The corroding beds.—The corroding beds are housed in large barnlike structures which are very dark and almost without ventilation. The lead buckles are placed in earthenware jars, the bottoms of which have been glazed on the inside to prevent the absorption of the acetic acid which is placed within them. About a pint of the acid is placed in the bottom of each jar, the acid is from 2 to 2½ per cent solution. The floors of the corroding beds,





No. 14.—FACTORY B — WHITE LEAD. Stripping the corroding beds.

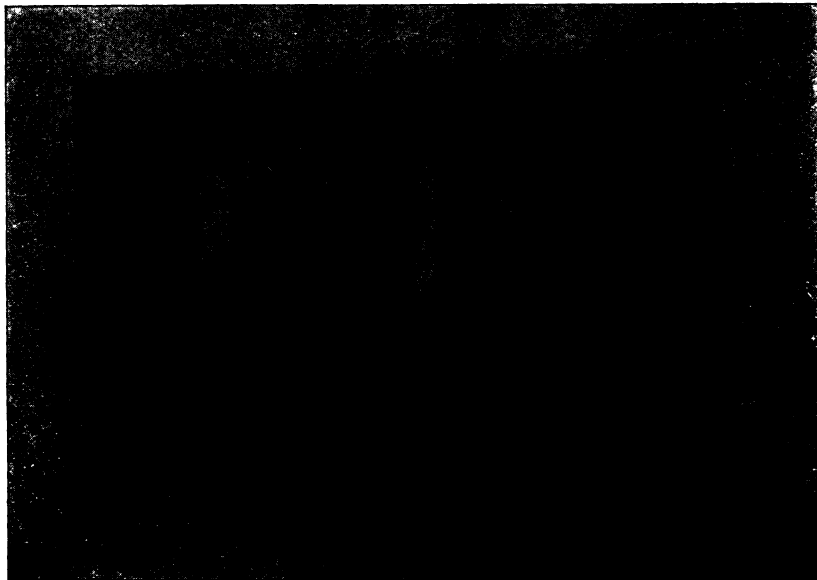


No. 15.—FACTORY B — WHITE LEAD. Stripping the corroding beds; showing appearance of corroded buckles in earthen jars.

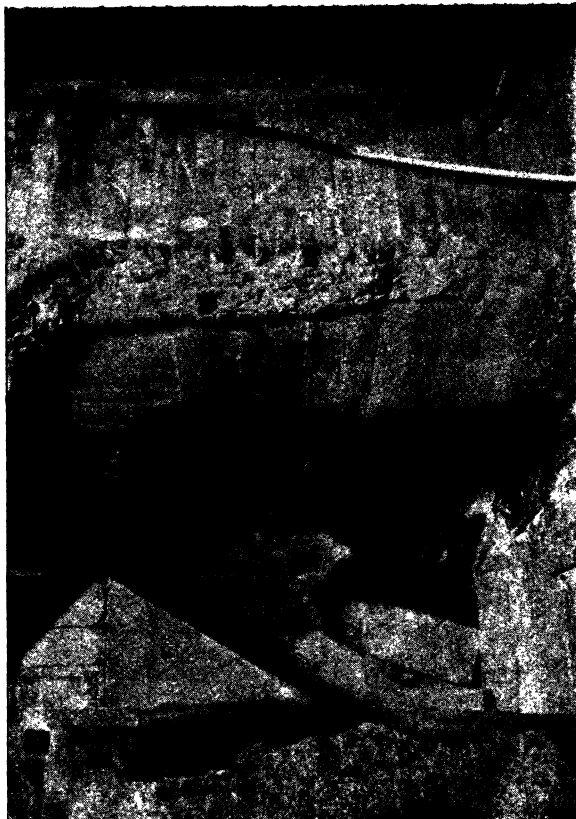




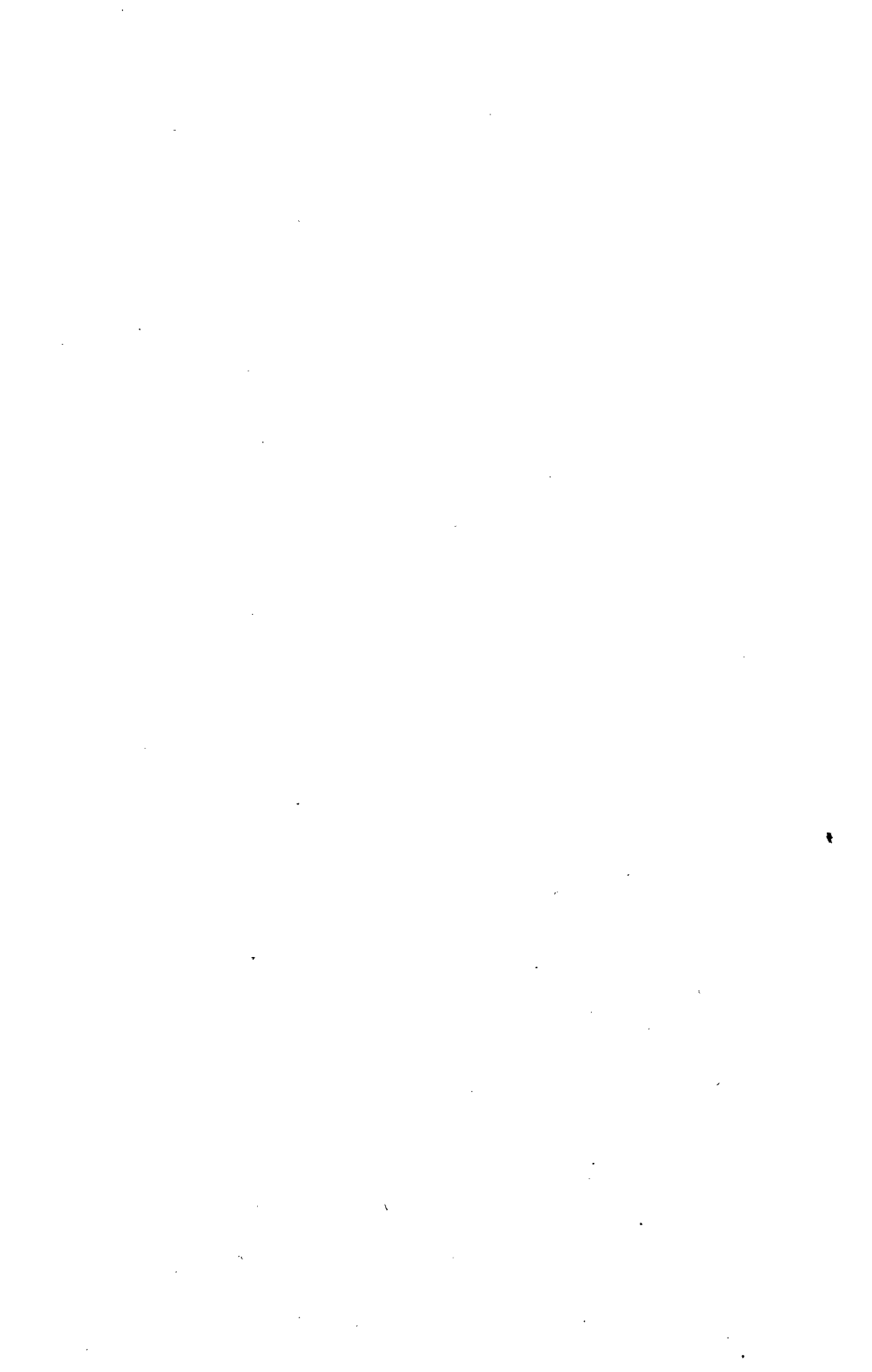




No. 17.—FACTORY B—WHITE LEAD. Remnants of buckles being emptied into conveyors.



No. 16.—FACTORY B—WHITE LEAD. Dumping corroded buckles into a chute which carries them to the separating machines.



which are about 20 by 20 feet square and enclosed on all sides by heavy, wooden partitions to the height of about 20 or 25 feet, are first covered with about 12 inches of tan bark. The earthenware pots containing the buckles and acetic acid are then placed on the tan bark as close together as possible. Boards are then laid over the jars, another layer of tan bark is added and another layer of jars and so on to a height of from 18 to 20 feet. The whole mass is left in this condition for about 100 days, during which time it reaches a temperature, through the action of the acetic acid and the tan bark on the lead, of from 140 to 170 degrees. With the "stripping," so-called, or taking down of these beds, the danger of working with white lead first appears. The removal of the boards reveals the buckles encrusted with a white frostlike material, which is the corroded lead known as white lead, or lead carbonate. These buckles are then emptied from the jars into wheelbarrows. (See photos Nos. 14 and 15.) More or less dust is occasioned during this process as the men must stand directly over the wheelbarrow and knock out the contents with their hands. The men working here were not protected in any way — a few wore gloves, but respirators and nose guards, which had been provided free by the factory authorities, had been refused by the men. Some of them wore bandana handkerchiefs about the noses and mouths. From this point on in the process there is practically no handling of the lead by hand. Therefore danger is greatly minimized.

3. Feeding corroded buckles into the separating system.— The corroded lead buckles are wheeled from the corroding bed to the entrance of the separating system, sometimes a considerable distance, in wheelbarrows. The wheelbarrow is wheeled to a chute where it is turned on its side and the contents dumped into the separating system. This chute is well covered by a hood which has a strong exhaust draft acting not only from a single central chimney, but also from the edges of the hood, thereby preventing the escape of dust from around the immediate periphery of the hood. (See photo No. 16.) Several wheelbarrows were emptied into the chute while the inspector was watching the process and on each occasion, although there was considerable dust raised, it was

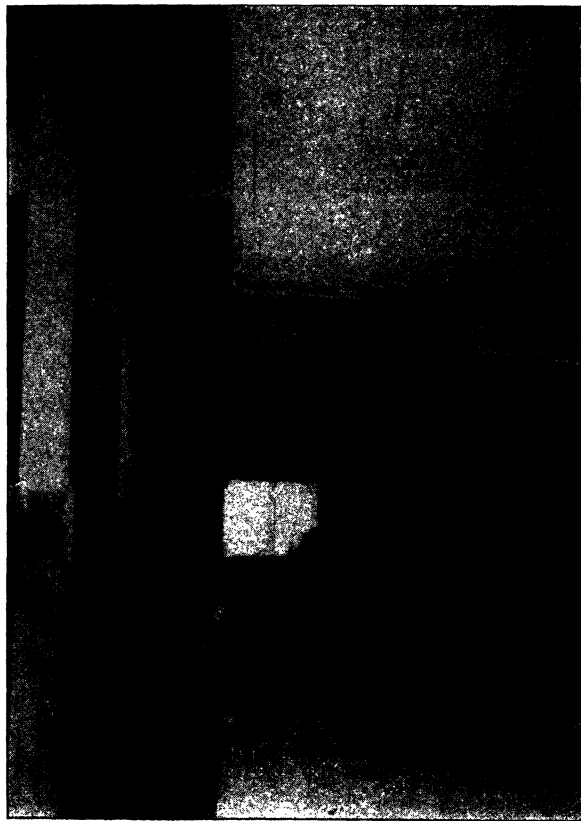
carried off immediately and almost completely by the powerful exhaust.

4. The separating and refining of white lead.—From the time the corroded buckles are dumped into the chute described above, the lead is not handled in the dry state. It is carried on an automatic elevator from the bin under the chute to the separators. Here it is shaken about through several screens which gradually eliminate all the metallic lead and reduce the carbonate to a very fine state. A plethora of water is then added to the dry white lead and it is carried through a succession of tanks in each of which the coarser particles are drained off until it reaches a final screen which is in constant motion and permits only the finest particles to go through and rejects any that may still be too coarse. (See photo No. 20.) The white lead is then in solution with water and is pumped into tanks where oil is added. The lead having greater affinity for the oil unites with it and rejects the water which consequently rises to the top of the tank and is pumped off. The white lead mixed with oil is then forced through tubes to the packing tables.

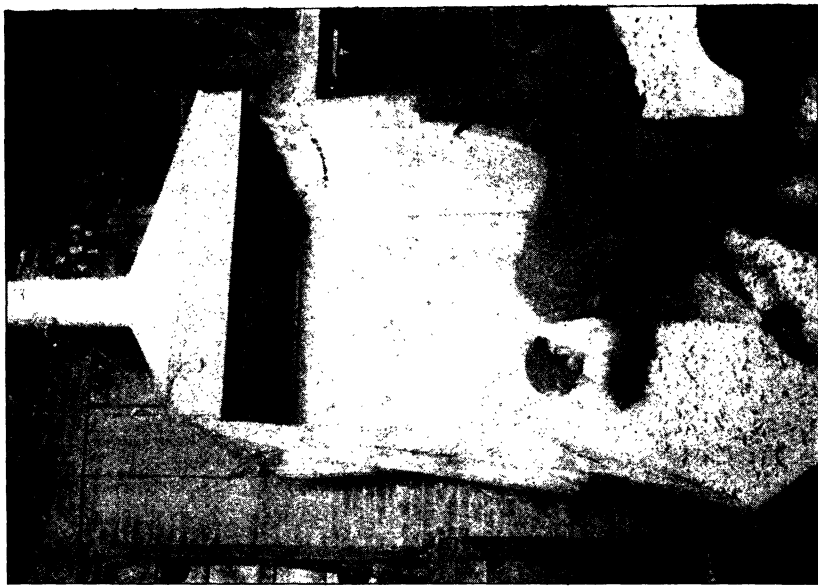
5. Packing the lead.—The white lead mixed with oil is now in the commercial state. It is run into metallic cans which are set on scales. When the package has attained a certain weight the worker cuts off the supply and clamps on the top of the can. The only danger in this process is that the worker will smear the lead on his clothing or convey it in some way to his mouth. With ordinary precaution this process need not be an especially dangerous one.

6. The dump.—The non-corroded lead which is rejected by the separating system is thrown out of a chute into a car. The chute is provided with a back draft exhaust and the car stands in a tightly-built house. (See photo No. 17.) When the car is full it is taken out, wheeled under an exhaust and covered around with a huge canvas and the contents dumped out on the floor. A worker then shovels the lead into wheelbarrows and wheels it off to be remelted. (See photo No. 18.) This process is a dangerous one and seems to be needlessly lengthened and involved.





No. 19.—FACTORY B — WHITE LEAD. The great vats in which the lead is washed.

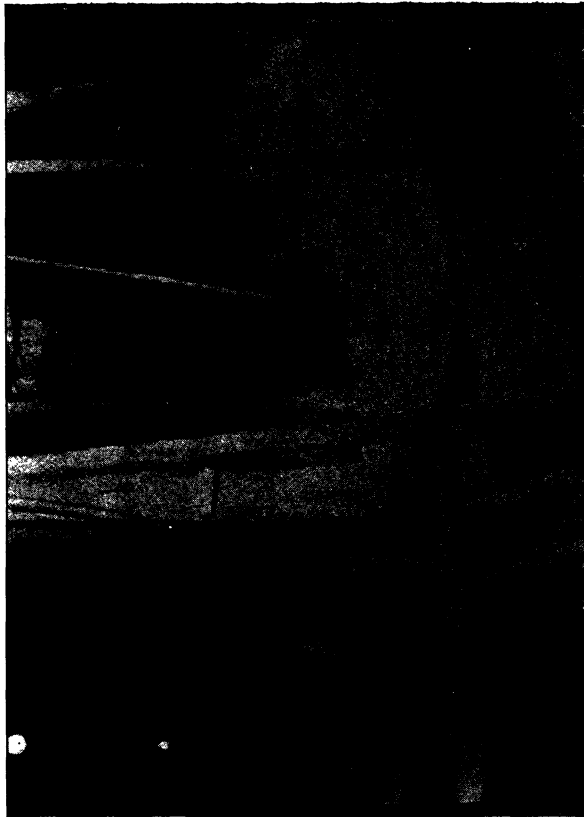


No. 18.—FACTORY B — WHITE LEAD. Shoveling remnants of buckles into wheel barrow.





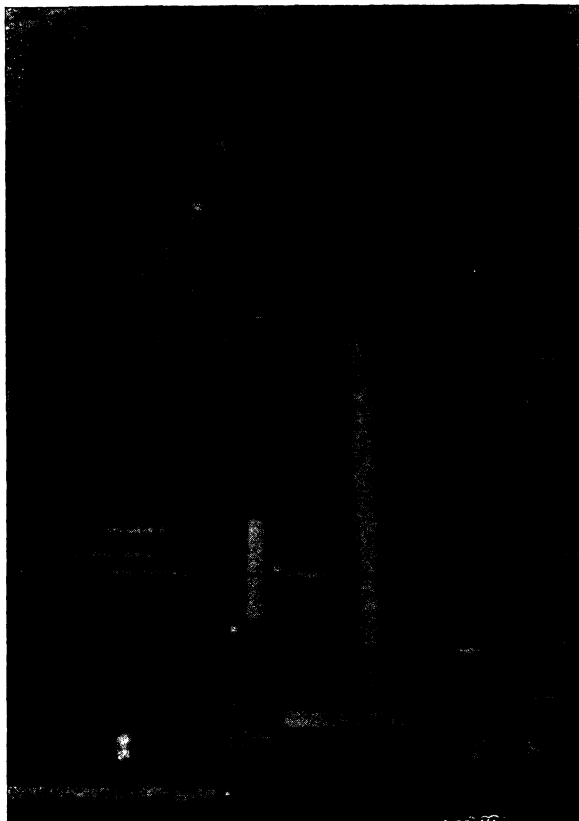
No. 21.—~~FACTORY B~~ — LEAD PIPE. Drawing out lead pipe.



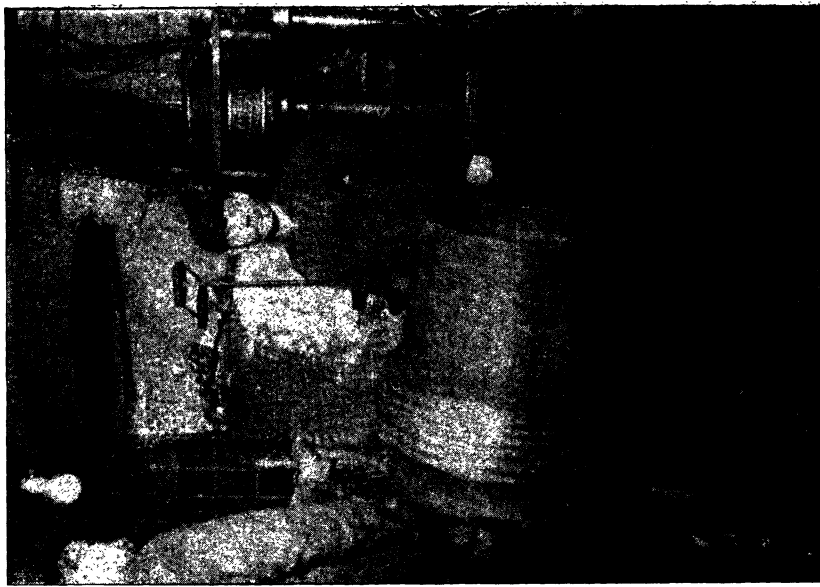
No. 20.— FACTORY B — WHITE LEAD. Final separating sieve. Last process before lead goes to mixing machines.







No. 23.—FACTORY B—SHEET LEAD. The rolling of lead sheets.



No. 22.—FACTORY B—LEAD PIPE. Drawing out lead pipe, and reeling it.



## II. *Provisions for Hygiene:*

1. The dust removal system.—Perhaps the most notable feature in this plant is the system for the removal of dust from all parts of the establishment. This is not done in a perfunctory manner, but there has been installed a very complete and efficient dust removal system. It is so efficient that there is very little dust to be seen about the factory or collected on the machinery. Even machines such as the revolving screens are enclosed in double jackets. The whole system culminates in a dust room which has recently been built on the top floor. This dust house contains two large bins into which the air is forced; above these bins are suspended bags about 1 foot in diameter and 24 feet in height. These bags are made of cloth which permits the air to pass through, but retains any dust particles. As long as the air pressure continues the bags are inflated, but with the reduction of the pressure the bags collapse and dust which is collected drops into the bins below. Some of this lead dust, however, remains adhering to the sides of the bags. The system is so arranged that no one need even go into the dust house to shake down bags; this is done by a mechanical contrivance operated from the outside of the house. This is really an extremely good system and is nowhere in the country, so far as the writer knows, in use on such a large scale as it is in this plant.

2. The blower system.—In some parts of the factory fresh air is forced into the plant; for example, in the engine room 40,000 cubic feet of air is withdrawn every minute and 30,000 cubic feet of fresh air is forced into the room. The atmosphere in the engine room was not super-heated but was at a very comfortable temperature.

3. A new welfare building.—At present this factory is not doing very much along sanitary lines, but there is at present under construction a large building which will cost about \$25,000 and which is going to be devoted almost entirely to improving hygienic and sanitary conditions among the workers. This new building, which is to be on the immediate factory premises, is to contain toilets, shower baths, washrooms, locker rooms, lunch

rooms and kitchen. The arrangement of the locker room is particularly interesting. As the plans are now drawn, a man will enter the building from the factory and go into the locker room for work clothes. Here he leaves the clothing which he has used during the day. He must then go through the bathroom in order to reach the locker room where his street clothes are kept. Every man, therefore, is provided with two lockers, one for work clothes and one for street clothes. The exact policies which are to be pursued in dealing with workers in order to induce them to use facilities of the bathroom have not been fully determined. The superintendent will try to require the men to take a bath each week and in the more dangerous parts more than one a week.

The welfare house, as it is called, is to be open in the evening for those who wish to come. It is to be provided with checkers, dominoes and other small games. When this building has been finished and is in operation, a considerable difference will probably be observed in the conditions. The present washing facilities are very inadequate.

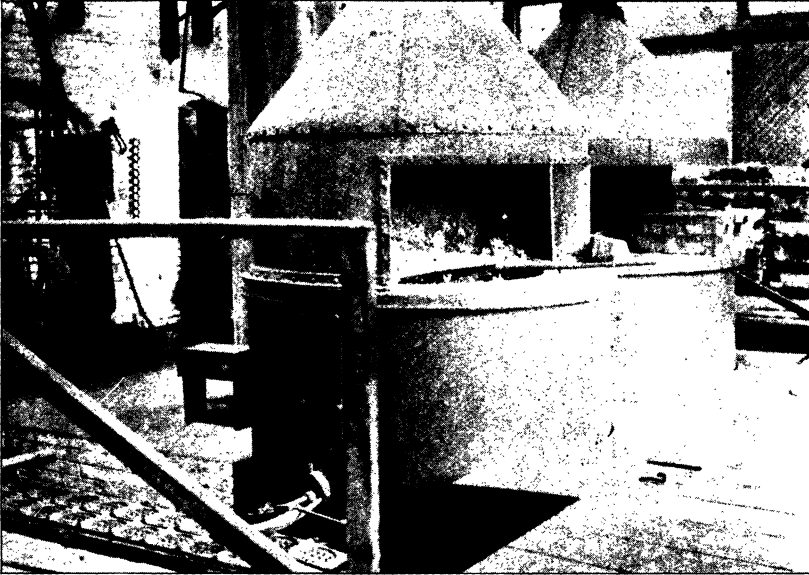
4. In November, 1910, a doctor was established in this plant. He comes every day at eleven o'clock and gives attention to any who need it. He states that the amount of lead poisoning has materially decreased since his coming to the plant. He makes no regular physical examination but goes through the plant at frequent intervals and looks over the men; any that seem to be anemic are sent to his office for examination. Most of the cases are, however, medical cases other than lead poisoning, and accident cases. The doctor reports 24 cases of lead poisoning from November, 1910, to November, 1911.

### III. *Suggestions for Improvement:*

There are two or three things that might very well be done in this factory which the writer believes would considerably improve the conditions and decrease the amount of lead poisoning.

1. **Suits of overalls** should be furnished the men at stated intervals — perhaps a clean suit each week.





No. 24.— FACTORY C — WHITE LEAD. Casting room.



No. 25.— FACTORY C — WHITE LEAD. Stripping the corroding beds.



2. Instructions somewhat more explicit as to the care of the body and the prevention of poisoning should be distributed throughout the plant, or perhaps handed to the individual workmen. A better method of giving the men instructions would be to have some person, fluent in the languages of the workers, give them individual instruction.

3. Regular physical examinations of all workers would be advisable.

4. With the facilities to be provided in the new welfare house, the men in the most dangerous processes might very well be required to take two, or even more, baths per week and be examined by their foreman as to whether or not they had taken precautions such as cleaning of teeth and fingernails.

It is quite evident that conditions in this plant have greatly improved. There was a time when the ambulance was a frequent visitor at the gates of the factory. There was also a time when the work of separating the white lead from the metallic lead was done by hand, the corroded buckles being beaten or pounded on large tables. Some of the older employees give vivid descriptions of the conditions in the plant at that time. The present system of dust removal and the organization of a continuous system of separating and refining the lead without hand manipulation has produced vast changes for the better. Among the interesting facts given by the head of the factory, was that the chief engineer had at one time suffered from lead colic. Lead poisoning does not seem to be a respecter of persons.

#### FACTORY C.

##### I. *Manufacture of White Lead:*

This factory which manufactures white lead only by the old system, occupies several very old buildings. Some of the corroding sheds are so dilapidated as to be quite out of plumb, and already the contents are being removed in order that they may be rebuilt. The factory employs at present 140 men. The table shown herewith shows the length of time the workers have been in the employ of this factory. It will be noted that almost half

have been employed less than one year. About half of the men are native Americans, while there are large numbers of Germans, Italians, Slavs, Poles and Lithuanians. During the past summer, as the season was somewhat dull, very few men were employed, usually not more than 15. The notices and warnings about the plant are in four languages: English, German, Italian and Polish.

1. The casting of lead buckles.—The casting room is similar to those in other factories. The furnaces were protected by hoods and fumes are carried off by an ordinary hood. The room, however, is much cleaner than that in the other factories, and one or two devices have been added which considerably improve conditions; for example, the endless chain on which the buckles are cast is placed in a pit on either side of the furnace (see photo No. 24) and the entire surroundings of the furnace and casting work are made of concrete. The buckles are cast by allowing a stream of molten lead to run over the moulds, which when they reach the end of the chain are dumped into a car. An old German is in charge of this work, who admitted having been employed in the lead factory for about 28 years, and at this particular job for 15 years.

EMPLOYEES IN FACTORY C: CLASSIFIED BY OCCUPATIONS AND LENGTH OF TIME EMPLOYED.\*

EXACT OCCUPATION OF WORKER	No. of employees	Employed less than 3 months	Employed 3-5 months	Employed 6-11 months	Employed 1-4 years	Employed 5-9 years	Employed 10-19 years	Employed 20-29 years
Stack dep't, building and discharging lead.....	28	3	3	4	11	6	1	.....
Laborers in yard, dock and storehouse, shipping and receiving lead.....	13	2	2	1	4	3	1	.....
Night watchman, night engineer.....	3	.....	.....	.....	.....	1	1	1
Mill hands grinding, mixing and packing lead.....	24	4	2	2	6	3	6	1
Engineer's dep't, machinist, pipe fitter, blacksmith, carpenter, stonedresser.....	10	1	1	3	4	.....	.....	1
Total.....	68	10	8	10	25	13	9	3

\*Information furnished by superintendent.





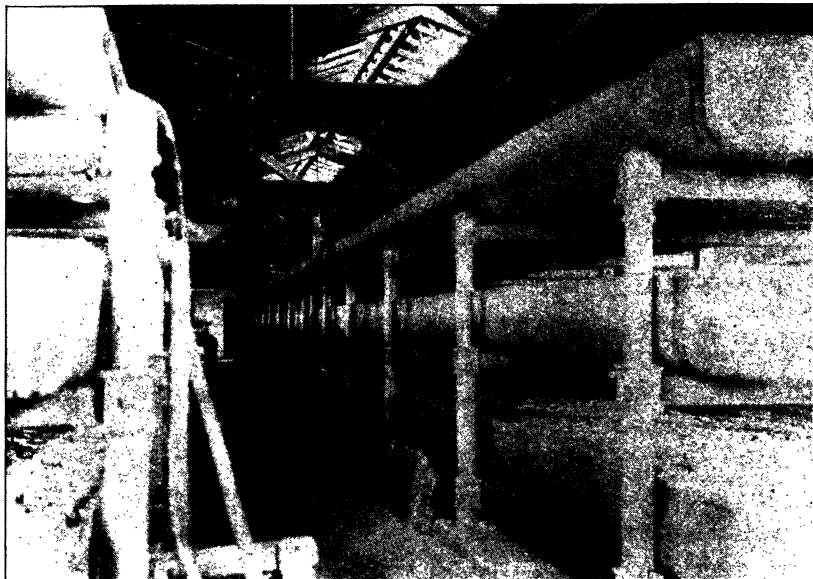
No. 26.— FACTORY C — WHITE LEAD. Emptying corroded buckets into conveyors, in the corroding stock house.



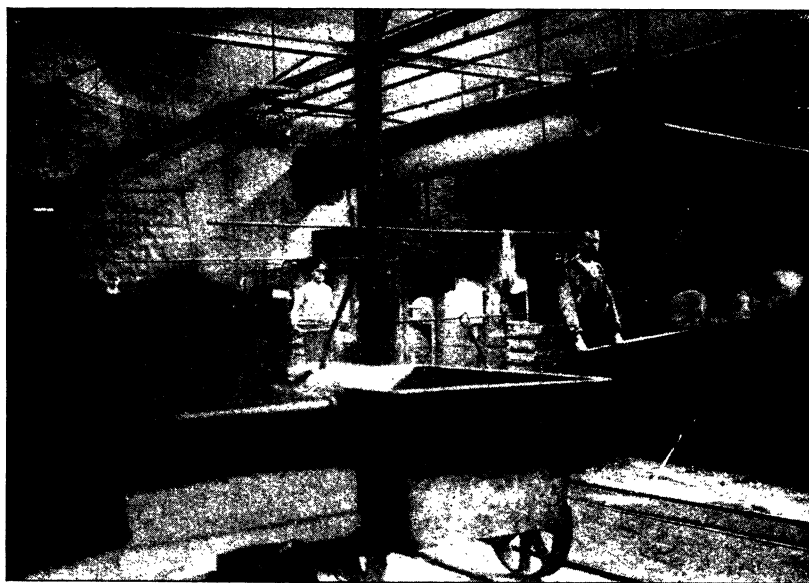
No. 27.— FACTORY C — WHITE LEAD. A portion of the separating machinery.







No. 28.— FACTORY C — WHITE LEAD. Drying room.



No. 29.— FACTORY D — LEAD OXIDE. Lead oxidizing furnaces, hand type.





2. The corroding sheds.—The corroding is done in the usual way by the old Dutch process. The floor of the bed is strewn with tan bark, on which are placed the earthenware jars, in the bottom of each of which is about a pint of acetic acid (2 to 2½% solution). The buckles are then placed in the jars above, but not in the acid; a layer of boards is placed over the jars containing the buckles; another layer of tan bark is placed on the boards, more earthen jars and so on. In the building up of these beds there is comparatively little danger. In the stripping of the beds, however, there is great danger. The jars are first dumped into small boxes about 1½ by 2 feet by 12 inches deep. (See photo No. 25.) These boxes filled with corroded buckles are then lowered from the beds to a car into which they are dumped. This car is covered; the cover is in three sections and only one of them is opened at any one time. During the process of removing the tan bark from the corroding beds, there is a considerable amount of dust raised in the corroding sheds. (See photo No. 26.) Doubtless the tan bark dust is thoroughly impregnated with lead.

3. Removing lead and separating system.—Cars filled with corroded lead buckles are taken from the corroding sheds through a tunnel under the street surface to the beginning of the grinding process. The car is then hauled to a chute, opened at the bottom, and the corroded buckles fall into bins below, which are connected with the grinding system above by means of an automatic elevator. In this chute is a very powerful exhaust which effectively retains the dust. The white condition of the woodwork in the immediate vicinity of which the cars are dumped, tests the presence of considerable quantities of white lead.

4. Separating and grinding.—From the time the corroded lead buckles are dumped into the chute and enter the grinding system until the white lead is finally packed in oil, it is not again exposed to the air in a dusty state. The first machine separates the corroded white lead from that portion of the buckle which still remains uncorroded. The metallic lead is rejected and is

thrown into a bin which stands in the open air under a shed. The white lead is then ground up and passed through a series of screens of smaller and smaller mesh. It is then carried to the floor above where it is mixed with a large quantity of water. This solution of water and white lead is run into large vats where it is gently stirred — a process calculated to send heavier particles to the bottom and to drain off, over a sort of dam, the lighter and finer particles. This process is repeated until the lead is sent through a very fine screen with a mesh measuring one one-hundred and sixtieth of an inch. From here the lead calculated to be mixed with oil is run into a large tank into which oil is introduced. The lead having a greater affinity for the oil than for water and being somewhat heavier is forced to the bottom. The water which remains on top is drained off. The lead, after being thoroughly ground between revolving stones, is forced through small tubes to the packers who weigh it into barrels and cans. These are headed up and the white lead is then ready for the market. This latter process is not dangerous except as the workers get white lead into their mouths.

5. The drying room.—The lead which is calculated to be packed dry is piped in solution to the drying pans which occupy two very large rooms. (See photo No. 28.) These rooms have many good sized windows; in one of them the inspector counted thirty. There is also a large 60-inch fan conveying the air from the drying room. There are two men employed in this department. The only special danger comes when the lead is dried and is ready to be packed in barrels. It is then carried to the chute and put into packing machines. This causes considerable dust and exposes the workers to danger.

6. Packing of dry white lead.—The machine used for this purpose is similar to that used for packing red lead in Factory D. There is a large cylinder which descends into the barrel and fills it with dry white lead and causes little or no dust. The barrel is then taken from the machine and headed up. In this last process there is more or less dust.

## II. *Provisions for Hygiene.*

There are notices posted at various points throughout the building in English, German, Italian and Polish, instructing the workers as to the dangers of the business and calling for cleanliness and care on their part. These instructions are not printed as fully as they might be, but they are placed in several parts of the factory. A wash room is provided for the men which is in a small building on the premises. This is of the ordinary sink type, but with hot and cold water. Soap, towels, brushes and work clothes are not provided. The superintendent declares that the men would carry them off. There is no dust removal system similar to that in Factories B and D. A doctor is employed by the factory management and any workers who are affected in any way are sent to him for treatment. Since the first of January, 1911, he has treated the following classes of cases: traumatic (accident) 8; sickness other than lead poisoning 6, plumbism (lead poisoning) 8, total 22. Of these cases of plumbism, the following types are noted: two case of intestinal type (mild), one case intestinal type (severe), four cases of chronic type (arterio sclerosis, anemia, etc.), 1 case of sub-acute. The doctor visits the plant regularly each week and examines the men in a casual way; that is, he goes through the factory and picks out any man whom he thinks looks anemic or affected in any other way.

## III. *Suggestions for Improvement:*

The factory on the whole is a good one and precautions have been taken. There is, however, no dust removal system similar to Factories B or D, which would be the first and primary improvement to be made. Suggestions for other improvements would include the following: better ventilation of the corroding sheds, and the wetting down of the tan bark with sufficient thoroughness to prevent the raising of large quantities of dust; the enclosing of the chutes which are used for drying the white lead, especially in the drying room; the provision of more adequate washing facilities for the workmen; shower baths, which the workmen should be required to use; provision of a place for


eating lunch; provision of clean working clothes each week. The superintendent is skeptical about providing overalls, but it is quite evident that this provision has worked out successfully in at least one other plant.

#### FACTORY D.

Manufacture of (1) Red Lead, Lead Litharge, (2) White Lead by Quick Process, (3) Sugar of lead.

The manufacture of red lead is, according to the doctor who attends both Factories B and D, more dangerous to the worker than that of white lead. There are about 300 men employed in the white lead works in Factory B, and about 80 in the red lead works, and yet he declares that he has more cases of plumbism in the red lead works and that they are more serious. In the case of white lead a simple treatment is the administration of a mild sulphuric acid lemonade, or the administering of some drug like potassium iodide or magnesium sulphide which will render the lead into lead sulphate, which is insoluble, and hence, with a good physic will be eliminated from the alimentary canal. A little rest and change of employment will effectually relieve the case. This, however, cannot be done in the case of lead oxide, red lead or lead litharge, and hence the lead is absorbed by the body tissues and when a sufficient amount is present the individual gives way to one or another of the forms of lead poisoning.

The factory now under consideration is making four products: red lead, lead litharge, white lead (by quick process) and sugar of lead (lead acetate). Precautions of an exceptional nature have been taken and the cases of poisoning have decreased during the last few years. At one time the factory enjoyed a very bad reputation — workers would accept jobs there only when no other employment was open to them. The work is almost all unskilled, the men seldom earn over \$17.00 per week. They are mostly Poles, Slavs, Lithuanians and a few Barbadoes negroes. The table attached herewith throws interesting light on the length of time that the men employed here have held their positions.







No. 30.— FACTORY D — LEAD OXIDE. Lead oxidizing furnaces — hand type.



No. 31.— FACTORY D — LEAD OXIDE. Lead oxidizing furnace. Mechanical type; discharging the furnace.





**EMPLOYEES IN FACTORY D: CLASSIFIED BY OCCUPATIONS AND  
LENGTH OF TIME EMPLOYED.**

EXACT OCCUPATION OF WORKER	No. of employees	Employed less than 3 months	Employed 3-5 months	Employed 6-11 months	Employed 1-4 years	Employed 5-9 years	Employed 10-19 years	Employed 20-29 years	Employed 30 years and over
Office staff.....	6	1	.....	.....	2	1	1	1	.....
Engineering staff.....	6	.....	.....	1	4	1	.....	.....	.....
Mechanics.....	2	.....	1	.....	.....	.....	1	.....	.....
Mill foreman.....	3	.....	.....	.....	.....	.....	1	2	.....
Grinding and milling.....	10	4	.....	1	2	1	1	1	.....
Packers.....	3	.....	.....	.....	.....	.....	1	2	.....
Furnace foreman.....	3	.....	.....	.....	.....	.....	1	2	.....
Furnace men.....	37	5	2	3	10	13	2	2	.....
Coopers.....	4	1	.....	1	1	.....	.....	.....	1
Total.....	84	11	3	6	19	16	8	10	1

*I. The Manufacture of Lead Oxide, Red Lead, Lead Litharge:*

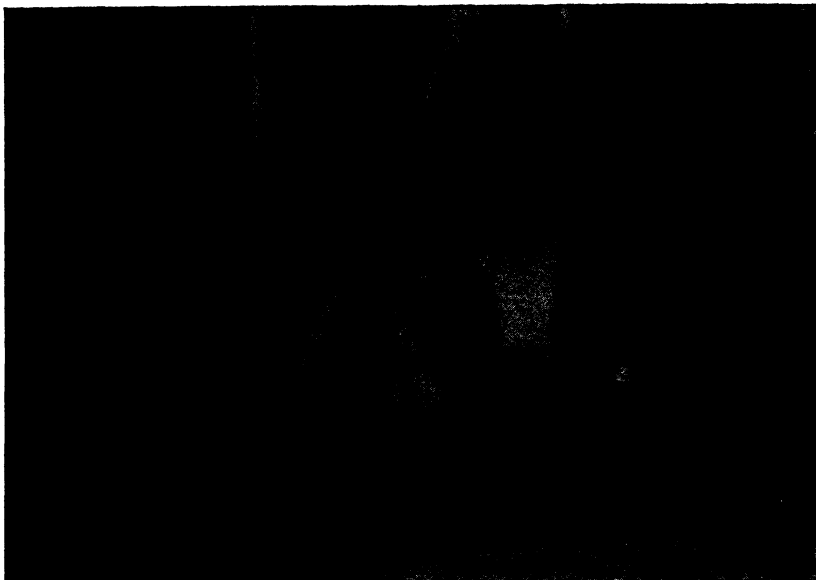
1. Oxidizing furnaces.—The first process in the making of lead oxide, red lead and lead litharge is the burning or oxidizing of the metallic lead. The lead pigs are introduced into the furnaces which are kept at temperatures of from 800 degrees to 1,700 degrees. The metallic lead quickly melts. The worker who attends the furnace is armed with a long-handled hoe, called a "ravel," with which he rakes backward and forward the molten metal. (See photos No. 29 and 30.) There is a powerful draft through the furnace, which continually passes over the lead. The oxygen of the air gradually unites with the lead to form lead oxide ( $\text{Pb O}$ ). The molten mass gradually changes form and becomes a powder of a light yellowish hue. This is lead litharge. The furnacemen work only about one-half the time; that is, they rake over the lead for about fifteen or twenty minutes, and then close their furnaces and wait during an interval of about the same length, and then repeat the process. One man only is employed to each furnace. The furnaces are not provided with any special exhausts. It is a question as to whether they are needed. There is a powerful draft through the furnace pulling any fumes away from the open door and up the chimney. Any fumes which escape, however, when the doors are closed are not drawn off, and any dust raised in the process of drawing is not removed.

2. Drawing the furnaces.—When the lead is sufficiently oxidized, the furnaces are emptied—the lead is raked out through the oven door into cars which are backed up against the ovens. The lead piled high in these cars then stands in the furnace room until cooled. Here is a possible source of danger. (See photos Nos. 29, 30.) Much of the finely powdered lead escapes into the atmosphere, as the material is raked from the ovens or from the uncovered cars as they stand in the workroom. The only difference between the manufacture of red lead and lead litharge is that the red lead must remain in the ovens, subject to the oxidizing process, considerably longer than the yellow lead or lead litharge. Otherwise the processes are almost indetical.

3. Delivery of lead to the milling machines.—The lead oxide carried in the open cars described above, is pushed to an open chute where it is tipped out and dumped. Considerable dust is raised by this process and the worker at this particular job is exposed to more or less dust of red lead and lead litharge. (See photo No. 32.)

4. Grinding and refining of the red lead and lead litharge.—From this chute the lead oxide is carried automatically to the upper floors of the building. Here the process of grinding and refining begins. The lead which is fine enough is drawn off by an endless screw and the heavier particles are rejected. This process is repeated over and over until a certain degree of fineness is attained. In the various rooms where the grinding and sifting is carried on there is an almost complete absence of dust. The machines are very carefully and completely enclosed. The separating machines are enclosed in double wooden jackets. There is seldom necessity for opening the machines and then only for repairs, as they are self-cleaning. Whenever it is necessary to repair any part of of them the whole system is immediately shut down. So complete is this dust removal system, that there was scarcely a film of dust on the walls or on the machinery. (See photos Nos. 33, 34.)

5. Packing red lead and lead litharge.—The packing of lead litharge is done dry and is largely done by machinery. The



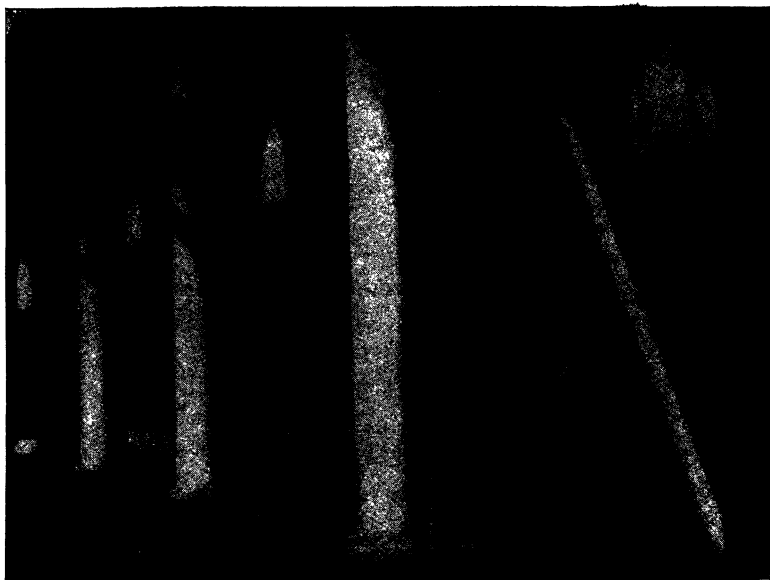
No. 32.— FACTORY D — LEAD OXIDE. Drawing the lead rejected from the screens into a car.



No. 33.— FACTORY D — LEAD OXIDE. Separating and conveying machinery.







No. 34.—FACTORY D — LEAD OXIDE. High speed grinding mills. The large pipes and inverted pyramids are part of the dust removal system.

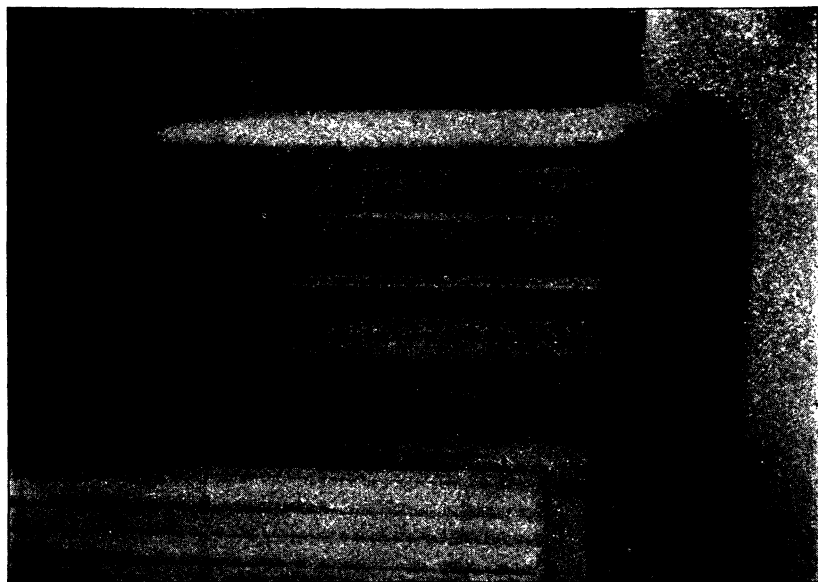


No. 35.—FACTORY D — LEAD OXIDE. Filling barrels with lead litharge (oxide of lead).

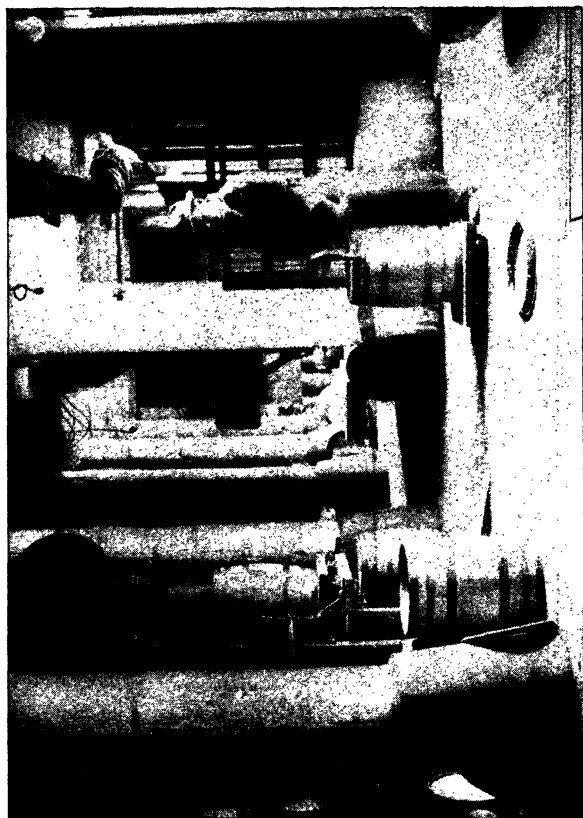








No. 37.—FACTORY D — LEAD OXIDE. Dust house.



No. 36.—FACTORY D — LEAD OXIDE. Filling barrels with litharge.



barrel is placed under a machine (see photos No. 35, 36) and the lead is then slowly emptied into the barrel. This part of the process is done without dust. The filling part of the machine, a large round cylinder, is then raised and the supply of lead is cut off. There is little dust in this process. The barrel, which is on rollers, is then rolled away from the machine and a head is put on, which again causes considerable dust. The negro who appears in photograph No. 35 has worked in this particular work for five years and has been absent only one week; this absence was occasioned by a severe fall. In this department the workers are, most of them, using bandana handkerchiefs about mouths and nostrils. This is the last process in the manufacture of lead litharge.

## II. *Hygienic Provisions:*

1. The dust system.—As indicated above in describing the various rooms where lead oxide is ground, the system of dust removal is excellent. As will be seen in the photograph showing rooms filled with machinery, there are long pipes leading in every direction; these pipes convey dust from the various machines to the dust room. These machines are provided with very powerful exhausts and the suction is so great that even when one of the great bins into which the dry lead dust is constantly pouring was opened for the writer's inspection, there was no dust emitted into the room. This dust taken from all parts of the factory is conveyed to the dust room. Here there are two methods of dust disposal. The one which will be seen at the left in photograph No. 37 is the older and is rather difficult to manage because the bags are placed so close together that whenever a bag breaks especially those in the center, it is very difficult to make repairs. The newer system of bags is seen in photograph No. 37. These may be easily removed and adjusted. All the dust is conveyed into the large receiving bins which are seen above and below the bags. As long as the air pressure remains on, these bags are distended, but when the pressure is released they flatten out and collapse and the dust which is adhering to their sides is precipitated into the bin below. It is not necessary to clean out this

bin more than once in a year and a half; when this is done the entire system is shut down. It is to be noted that even in the dust room there is very little dust to be seen clinging to the walls or on the floor.

2. Miscellaneous provisions.—The workmen are provided with a washroom and a room where they can put their street clothing. This room is in the cellar and is lighted by one small window only, necessitating the use of gas. At one end of the room, which is screened off by an iron lattice partition, there is a series of hooks where the men can put their street clothing. This part of the room may be locked. There are benches in the room but no lockers. The superintendent, however, finds this system more satisfactory than lockers which, he contends, quickly fill with refuse and various odds and ends and are difficult to keep clean. There are about ten washbowls provided with hot and cold water. Originally, three shower-baths were installed in this room but the men did not use them; in fact, the superintendent tells me that the only man he knows of who took a bath, never came back to work. No towels, soap or brushes are provided. No overalls or work clothing are provided. Doubtless one of the reasons why the men did not care to take baths is that the place set aside for this purpose is so dark and dingy. On the whole, the provisions for washing and personal hygiene may be said to be inadequate in this plant. There has been a great diminution in the number of cases of lead poisoning since the introduction of the dust removal system.

### III. *The Manufacture of White Lead by the Quick Process:*

The manufacturers of white lead have for many years been searching for a quick process for making white lead. One of the processes, the so-called "Carter" process, is used in one department of this factory for manufacturing white lead. The product which results is white lead; in fact, it is much whiter lead than was made by the old "Dutch" process. Many painters find it convenient to put a little of the quick process white lead into a quantity of old Dutch white lead in order to give a whiter color.

The quick process white lead, however, has not the hiding power of that made by the old "Dutch" process. Its grain, or texture, is so fine that it can not be used as a coverer. The process, which presents very little danger aside from handling of the lead, is a comparatively quick one since it may be made in about 24 hours. It is, however, on the whole, more expensive because with a given area a smaller quantity in the long run can be made. The molten metallic lead is run through water which brings it out in comparatively small pieces in a rough, ragged condition. This lead is placed in a large vat to which acetic acid is added; a lead carbonate is then formed by the combination of the lead with the acetic acid. It then runs through several processes which are entirely enclosed and from which there escapes neither fumes nor dust. The finished product is white lead and oil. The lead throughout this process is never in a dry state and, therefore, the danger is minimized.

#### IV. *Manufacture of Sugar of Lead:*

The manufacture of sugar of lead is also carried on in this plant, and is one of the most dangerous processes. Lead litharge is mixed in large vats with acetic acid; it is then boiled and run into vats where it is allowed to crystallize. One boiling, however, is not sufficient to purify it or to reduce it to the necessary fineness of texture. It is then reboiled and again allowed to run into vats where it crystallizes. This is the final process and lead sugar or lead acetate results. The sugar of lead itself is poisonous. It is very sweet to the taste and is very soluble, which make it especially dangerous. It is constantly exposed in a dry state and several men come closely in contact with it. They handle it with their bare hands and hence frequently get it into their mouths.

## II. MANUFACTURE OF PAINT AND COLORS

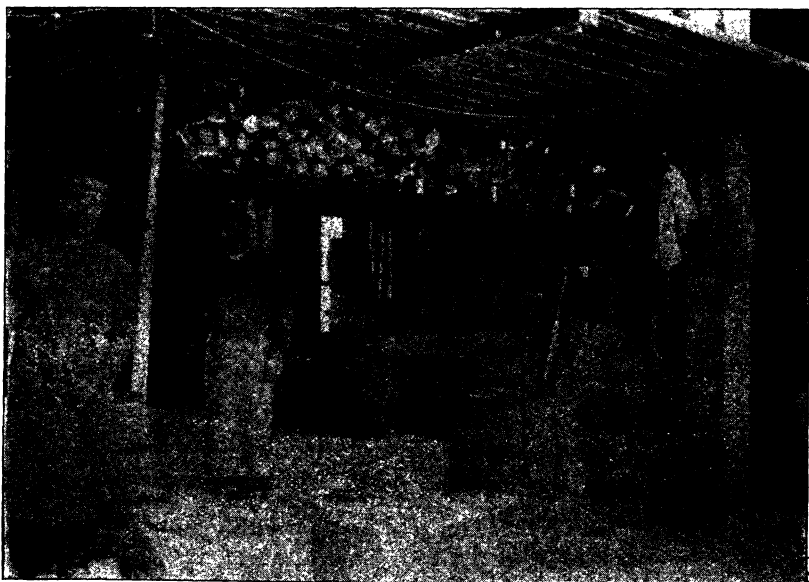
The industry, which is second only to the manufacture of carbonate of lead and lead oxide as a source of lead poisoning, is the manufacture of colors, both oil colors and dry colors. In this group of industries, two factories have been inspected. On the

whole; the sanitary and hygienic conditions were much worse than in the factories manufacturing the red and white lead. The reasons for such conditions are not far to seek. In the first place, many of the factories manufacturing paints and colors are much smaller than those manufacturing red and white lead. The latter products can only be successfully made in comparatively large plants — plants large enough to keep a force of men continuously building and stripping the corroding beds, each of which remains undisturbed for 100 days. In the manufacture of paints and colors, however, a small grinding mill and a little dry room suffice. This may appear to be uneconomical production, but many concerns, not paint manufacturers, grind and mix their own paints. A second reason for the relatively bad conditions in this group of factories is that lead poisoning is less prominent — the danger has not been brought home to the manufacturer as closely and convincingly as it has in the case of the white lead works. The inspectors in their examinations of these factories have found employers who did not recognize the seriousness of lead poisoning in the least. In fact, in none of the factories making paints and dry colors were printed instructions concerning the dangers of the work posted in the factories. Very often superintendents claimed that they or their foremen instructed the workers personally, but the very fact that a small proportion of those employed spoke English and that orders were habitually given in pantomime establishes the futility of such instructions even if conscientiously carried out.

Conditions in some of these factories were really deplorable. Dressing and locker rooms, when provided at all, were of the most primitive sort. Photograph No. 75 shows a typical dressing room — small, dirty, unventilated, a leaky shower bath in the center of the room. On the other hand, conditions are very different in comparatively modern factories where considerable care is taken of the workers. Systems of ventilation, if present at all, were often not such as to be of value. One large dry color factory had installed a very complete dust removal system. But



No. 38.— FACTORY A — PAINTS. Mixing white lead with oil.



No. 39.— FACTORY A — PAINTS. White lead department.





unfortunately, the exhausts on the grinding machines for example, were far above the machine and above the heads of the operatives. If, then, they worked with any effectiveness their sole result was to pull the dust up into the faces of the workers. Only a system of localized exhausts — exhausts immediately over and if possible enclosing the machinery — will be effective in protecting the workers.

Many of the plants which manufacture dry colors also manufacture Paris green. A full description of some of the processes in these factories will be found in Appendix A to this report.

From the paint manufacturers it was learned that pure white carbonate of lead is passing out of use and that it is being replaced by zinc white, or a new white lead called "sublimed" lead, which is not as poisonous or as injurious as the carbonate of lead. This new paint, the manufactureres contend, has not as great "hiding" power as the old "Dutch" process lead but has greater "covering" power. The distinction is this — the carbonate of lead will cover up and completely hide dark figures, a thing which would perhaps require two or more coats of the zinc white or the "sublimed" lead. The latter, however, in merely covering surface will go much further on account of a greater capacity to absorb oil. The exact facts concerning these substitutes for white carbonate of lead produced by the old "Dutch" process could be determined only after an exhaustive investigation. It is sufficient to state here that there are now substitutes for pure white lead which are less injurious on the market, for which the makers claim superior advantages and which seem to be competing successfully with the original product. Much of the so-called "white lead" which is sold on the market as "pure white lead" is not carbonate of lead produced by the old "Dutch" process at all, but is composed largely of zinc white and "sublimed" lead.

In the descriptions of the factories which follow, no attempt will be made to divide the manufacturers of paints mixed with oil and those making dry colors. Many plants make both kinds of colors.

## FACTORY A

*I. Manufacture of Paints and Chrome Colors:*

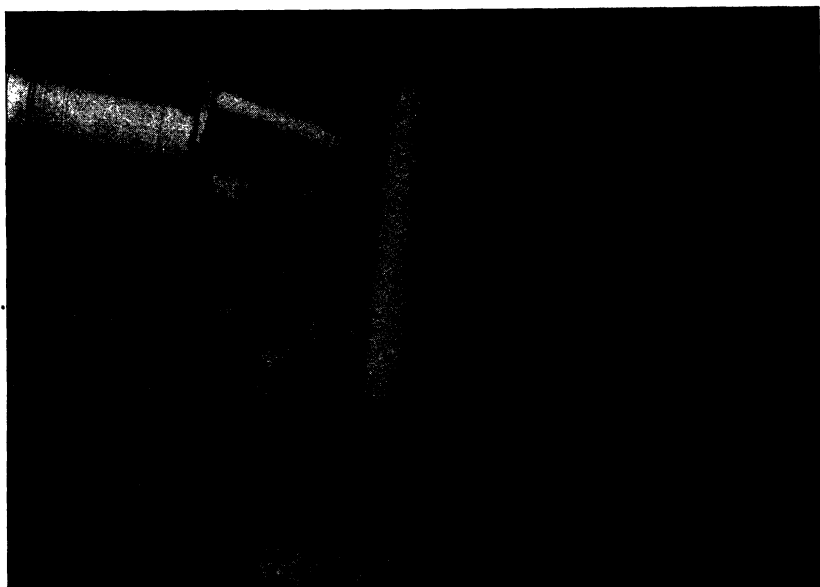
This factory employs about 150 people, of whom about 25 are women. They are of many nationalities, the majority, perhaps, are Americans, but there are also large numbers of Poles, Russians, Italians and other recent immigrants. The plant occupies a new and rather well arranged, well ventilated and well equipped building. The processes are complicated and much of it is of a mechanical nature; the actual handling of the products by hand is not usually necessary. Precautions have been taken throughout the factory to prevent poisoning. Every man employed is required to sign a release, exonerating the company in case of accident or disease. In consideration of this release a few of the employees who are most endangered are given somewhat higher wages.

1. Mixing solutions and drying colors.—The various colors for making paints are mixed in large vats. In some of these processes there is danger, arising from fumes or from dirty hands and clothing, but ordinarily the wet processes of mixing paints are non-injurious. The solutions in the smaller vats are drained off into other larger vats and water is added which is designed to wash the colors thoroughly. The heavier portions gradually settle to the bottom and the water is drained off. The residue, which is pure color slightly moist, is taken out and put on racks and conveyed to the drying room where all moisture is finally eliminated. The color is then ready to be ground. There is more or less danger in handling these colors which increases as they become more concentrated and drier.

2. Grinding and mixing oil colors.—The process begins with the arrival of the white lead which is in a dry powdered form. This lead is thrown into chutes which lead to grinding machines on the floor below. (See photo No. 38.) The foreman in this department declared that the white lead was usually mixed with oil before being put into the chutes and a couple of small hand cars nearby were filled with an oil mixture of white lead. How-

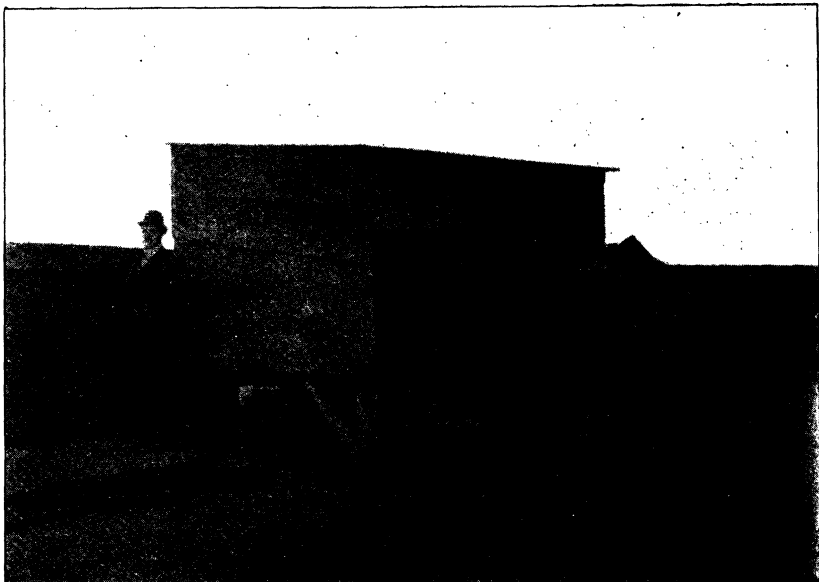


No. 40.— FACTORY A — PAINTS. Grinding red colors



No. 41.— FACTORY A — PAINTS. Grinding green colors.



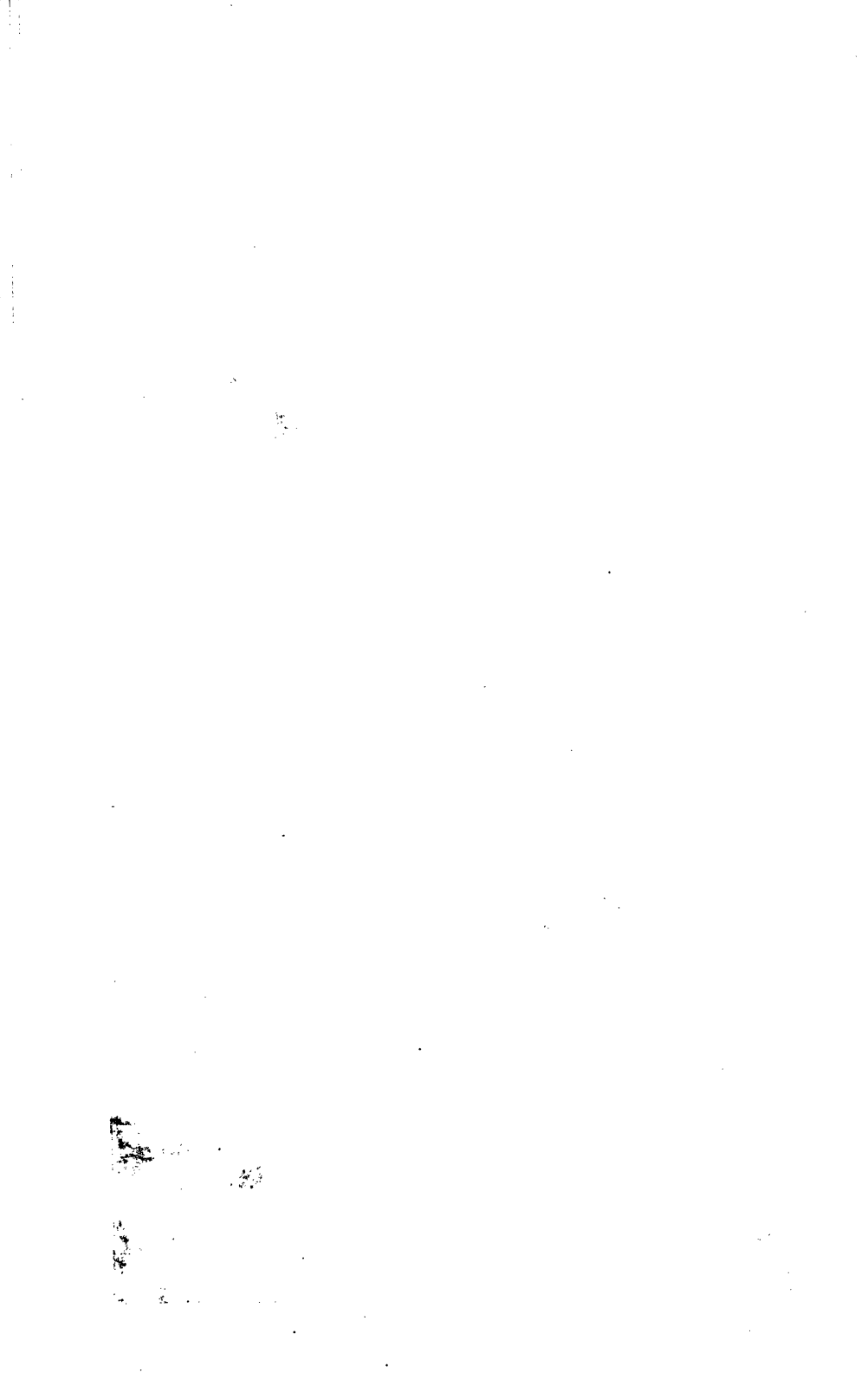


No. 42.— FACTORY A — PAINTS. Dust house. The dust is brought here by means of a suction fan.



No. 43.— FACTORY A — PAINTS. Arrangement of vats in red color room,





ever, while the inspector was in the room a workman began to fill one of the cars, taking the dry white lead powder from a barrel and dumping it into one of the cars. There was no oil in the car before the lead was put in, the workman, however, immediately rectified the mistake by dashing for a can of oil which he dumped into the car. (See photo No. 39.) The grinding and mixing of the white lead and oil is done largely by machines and furnishes very little opportunity for dangerous contact with the lead compounds.

3. The mixing and grinding of colors.—Dry colors after leaving the drying room are taken to the grinding and mixing machines. These occupy an entire floor of the building, but the room was so dark when the inspector arrived at 4:00 P. M., that photographs could not be taken by natural light. The room was also filled with dust. Machines which are set about the room are of different colors indicating the color mixed in each. Chunks of color material are thrown in at the top of the machine and ground between two revolving stones (see photos Nos. 40, 41) with a circular motion. There is more or less dust accompanying this process, which, in case of the chrome colors, is dangerous. In fact, almost all of these colors have some lead in them which varies from 5 to 80%. The worker stands in front of the machine and with a wooden hoe pulls backward and forward the finely powdered colors which are within. More or less dust was constantly escaping. At one of these machines a worker was observed cleaning out the wooden bin into which the colors had been put. He was on his hands and knees in front of the low opening and was brushing out the color with a fine brush. Clouds of dust were coming from the wooden bin and rising about his face and head. All the men that worked in this department were very dirty, their faces were covered with many hues of the rainbow. The foreman of this work declared there had been no cases of lead poisoning for forty years. One of the workers there who was approached in the absence of the superintendent and foreman said several of the men had had attacks of lead colic and that at that moment two men were home on that account.

4. Making of water colors.—In a small, light, well ventilated workroom there were two or three men and four girls packing various shades of color which were put up in little packages for use of water color painters and for use in schools. The foreman in charge declared that there was no lead used in paints made in this department because school authorities would not permit poisonous paints to be used in schools.

5. Labeling cans.—There were a number of young women working in the labeling department, but none of these come in contact with the lead.

6. The making of tin cans.—This firm makes its own tin cans which is done in a large well lighted and well ventilated room. The only danger in this process is the soldering, but so little work is done and the conditions are so good that it is very doubtful whether there is any danger.

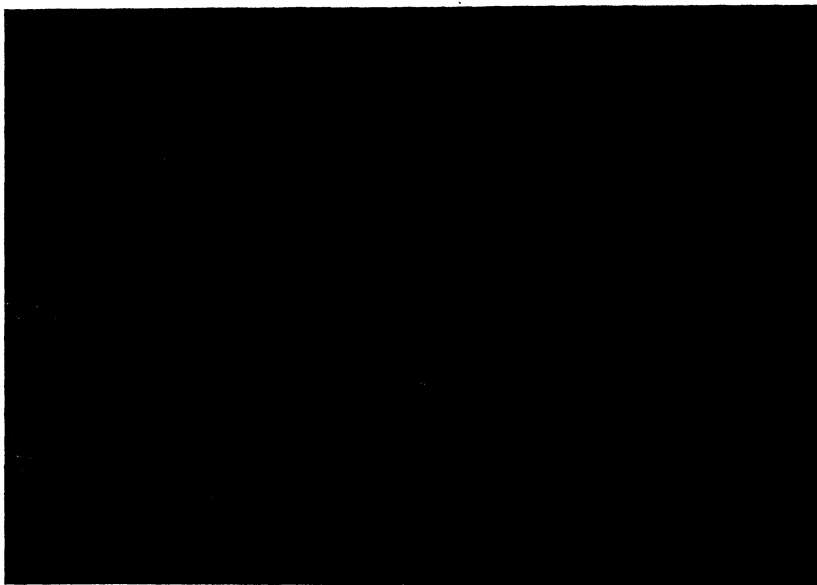
## II. *Provisions for Hygiene.*

On the whole, this establishment can be said to be relatively a good one. There are a number of precautions taken which deserve mention. There are washrooms and lockers for both men and women scattered at various points throughout the factory. There is a ventilation system which connects with all parts of the plant. It is, however, a general system and not localized. This would be a very good system for a clothing factory, but in a dusty trade it does not meet the needs of the situation. All the dust is conveyed from the various machines to the roof where it is caught in dust houses. (See photo No. 42.) These dust houses are of various colors due to the kind of color used in the machines. They are about eight feet by eight feet by six feet and screened on three sides, which permits the air to pass through and out but retains all the color materials. These houses also contain the exhaust fans. The workers are furnished with various safeguards, such as respirators. They are instructed to some extent as to the dangerous character of the business. They are given towels, soap, overalls, clean linen cloths and various other





No. 44.— FACTORY B — PAINTS. Steam pressing blue colors.



No. 45.— FACTORY B — PAINTS. Emptying lake colors from drying room into barrels.





sanitary conveniences. There are no printed instructions posted throughout the shop. The men who are at work at the dangerous occupations are paid somewhat higher wages, but the occupations which are considered dangerous are absurdly few.

### III. *Suggestions for Improvements:*

The principal suggestion to be made is that there be a system of local ventilation with powerful exhausts placed immediately in front of the dusty processes to take the dust away from the workmen.

A useful improvement would be the enclosing of the machinery in dust jackets. This is especially true of the parts connected with the grinding of colors. This process could thereby be rendered almost dust tight. Compulsory washing and bathing would doubtless reduce danger and the installation of a lunch room apart from the place of work would be an improvement, as at present men are permitted to eat in the workrooms.

## FACTORY B.

### *Manufacture of Dry Colors:*

This is one of the largest plants in this line of business and employs 70 men. The hours are ten per day, nine on Saturday, 59 hours a week. The manufacture of any dry color is essentially a simple process, although it takes considerable time and a large amount of space with a small labor supply. The processes may be divided into the main stages:

1. The boiling and preparing of the solution.
2. Washing out of the acids.
3. Filtering and pressing of the solid residue.
4. Drying of the pigments.
5. Disintegration and bolting process.
6. Packing.

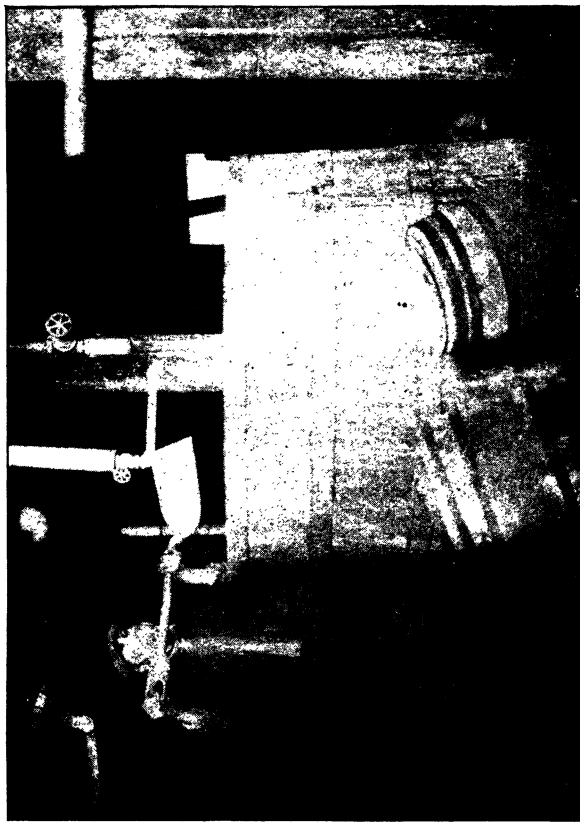
In this particular establishment there are four dry color departments. These are:

- a. Manufacture of lake colors.
- b. Manufacture of blue — prussian blue, purple, etc.
- c. Manufacture of yellow ochre, sienna, etc.
- d. Manufacture of green color.

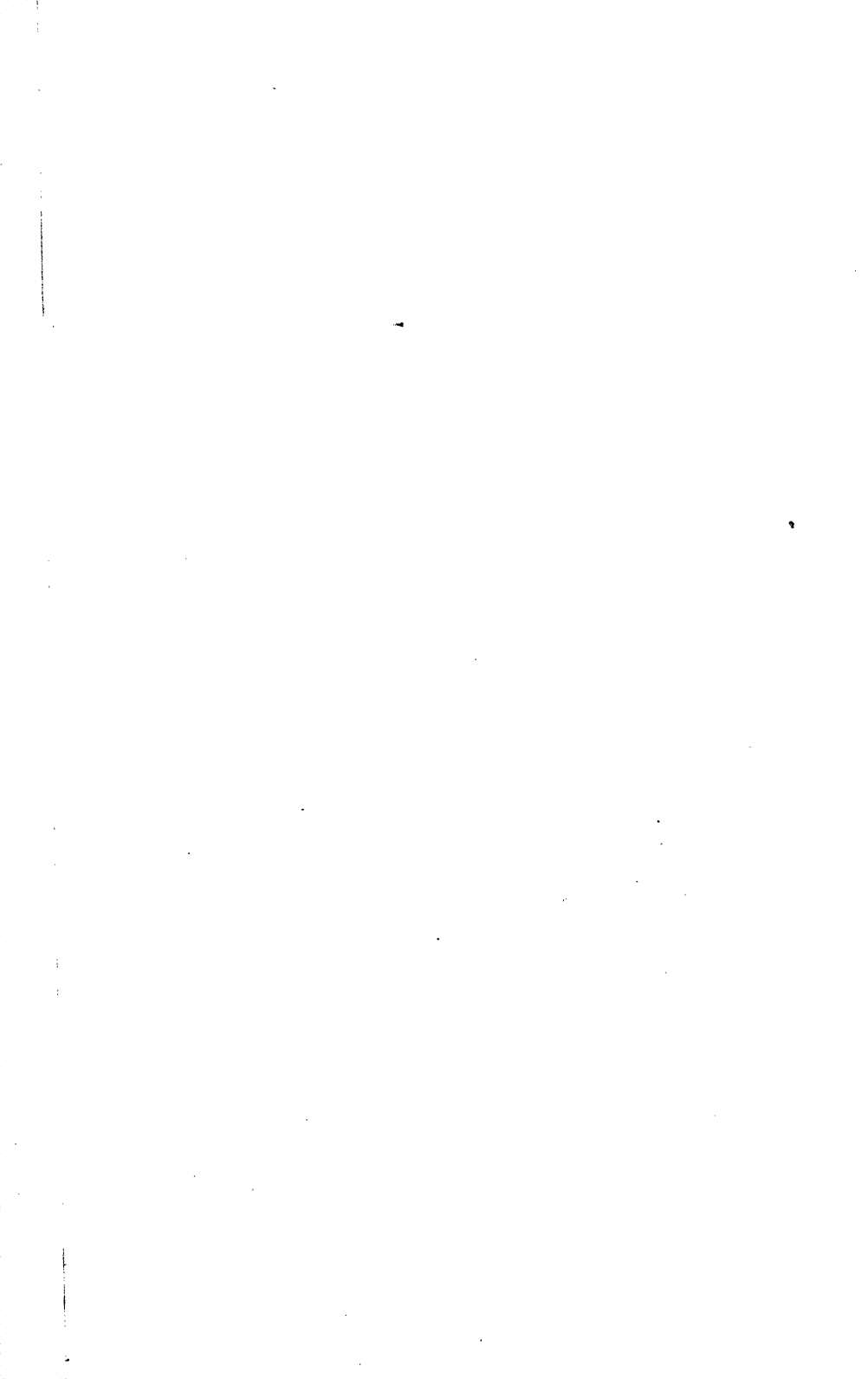
(a.) The manufacture of lake colors.— The original pigments are first boiled in large vats which are near the top of a large barn-like room (see photo No. 43). These vats are placed one above the other. The top vat is where the boiling is done; from this vat the solution is conveyed to the lower tank where the oxidizing agents are added; in a still lower and larger vat the colors are thoroughly washed and then drained off into the filter. This filter may be of two kinds; first, the old hand press which has come down from the time of the Pharaohs. It consists of filling bags with the wet color mixture and piling them one above the other. A man squeezes out the moisture with a long wooden lever which he leaves with a weight attached to hold down the bags of color. The process is used where the material is wanted for shipment in a wet state. The other and more modern process is to force the diluted mixture into a series of filters. Here it is pressed by hydraulic machinery. When it comes from this filtering process it is sometimes shipped immediately, but a large part of the product goes to the drying room. The contents of each individual filter is put on a pan or tray which is carried into the drying room. There it remains at a temperature of from 130-180 degrees until the moisture is entirely taken out of the pigments and is left in a dry, hardened form. The pigment is then taken to the grinding machines, where disintegration takes place. It is made into a powder by being ground between revolving stones. The packing department is immediately under the mills, where it is run into barrels by a process which is not very dusty. In the making of lake colors about 5% only of the pigment is lead. Whenever a color with a large per cent of lead is ground

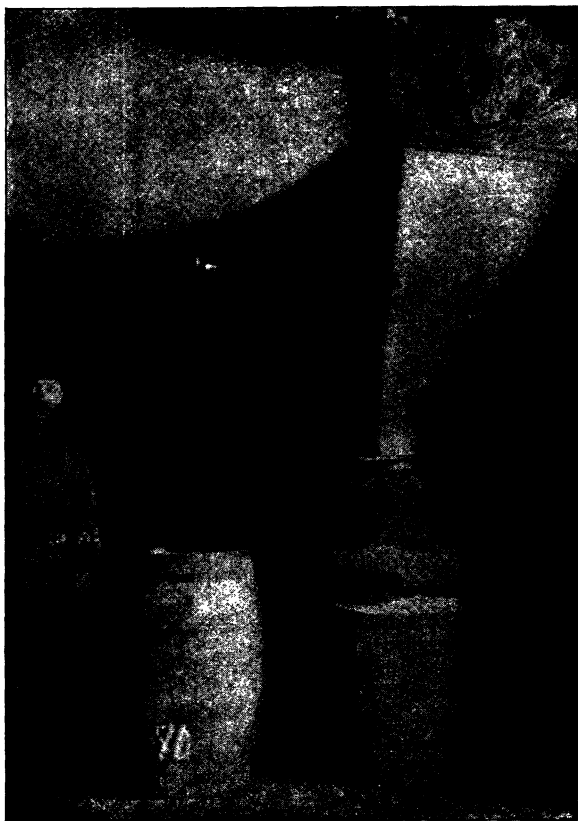


No. 47.—FACTORY B — PAINTS. Carrying trays of wet paint to the drying room.



No. 46.—FACTORY B — PAINTS. Adding lead litharge, by means of open shovel, to dissolving bath.





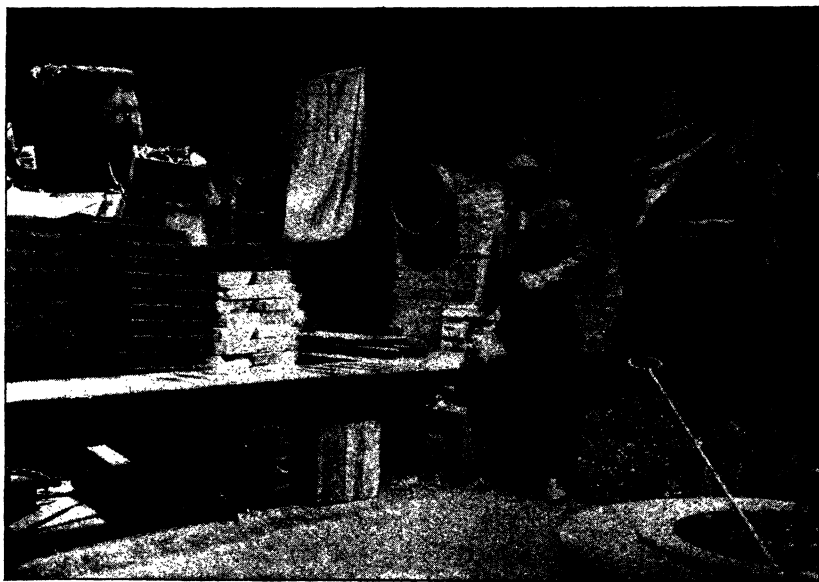
No. 48.— FACTORY B — PAINTS. Filling barrels with chrome yellow.





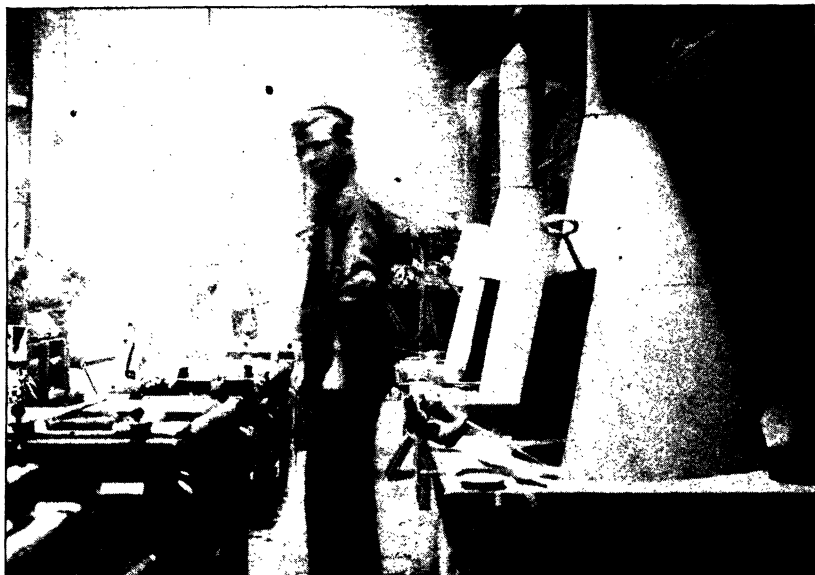


No. 49.— FACTORY A — LEAD REFINING. Pot of lead drawn from the “sweater,” from which the caster is ladling molten lead.

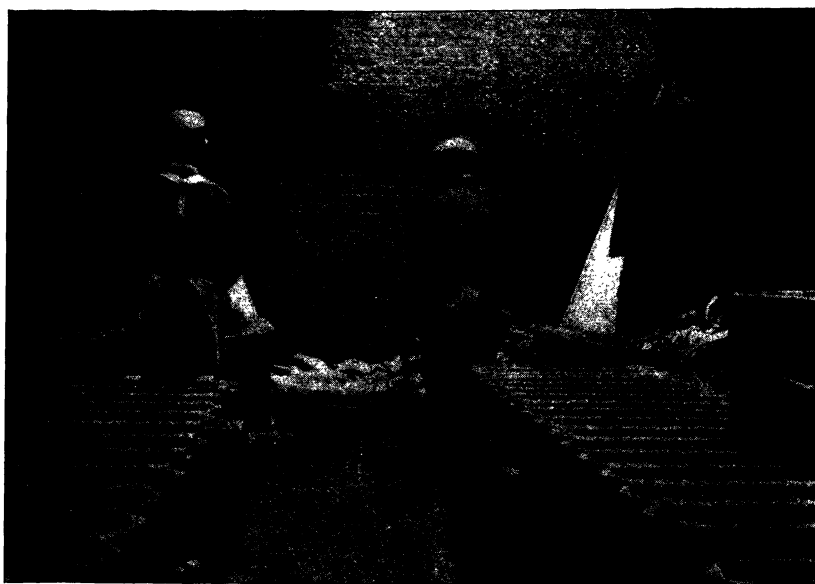


No. 50.— FACTORY A — LEAD REFINING. Lead pot, same as 49. Pouring lead into moulds.





No. 51.— FACTORY A — LEAD REFINING. Kettles for melting and refining lead.



No. 52.— FACTORY A — LEAD REFINING. Lead kettles. Stirring lead, and adding rosin, etc.



there is a special room set aside for this purpose. The pigment is then ground within the specially enclosed room and no employee enters this room until the dust has well settled:

(b.) *Manufacture of blue color.*—The processes in the manufacture of blue color are practically the same as those in the lake color department. It has so far, however, been found to be impractical to use the dustless mill in connection with the blues, on account of some differences in the texture of the materials. The manufacturing departments in which the blue colors are made are somewhat darker than the others, on account of the walls being colored with pigment.

(c.) *Manufacture of yellow color.*—In the yellow, and the following green colors, we find the highest percentage of lead that is found in any of the colors. It varies from 75-80%. Special precautions are taken against poisoning by lead. The elementary processes are similar to those in the other colors, with one possible addition. At one stage in the process, when the color is still in solution, a worker sprinkles the solution with lead litharge. He does this by scattering the lead from a shovel over the mixture. (See photo No. 48.) Although he wore a respirator, doubtless considerable of the very fine lead oxide was distributed through the air.

In packing the dry yellow colors, particular precautions are taken. A very large dust collector is attached to the filling machine, and when the filling is going on this bag is distended and collects the dust, which would otherwise scatter itself through the air. (See photo No. 50.)

(d.) *Manufacture of green color.*—Like the yellow color, the green color has a very large proportion of lead content, varying in different qualities from 75-80%. The processes in the manufacture are exactly similar to those already described.

## II. *Provisions for Hygiene:*

Although, as already stated, this is a comparatively old plant, it has many very excellent precautions. There is notable care

exercised in providing and requiring the men to wear respirators. There are many devices which prevent dust, like the dustless mill, the special room for grinding, the special dust removal apparatus in connection with the mills. A large room has been set aside and equipped with chairs and tables as a lunch room. The men don't take care of it, however, and if it is allowed to become dirty it will itself become a source of danger.

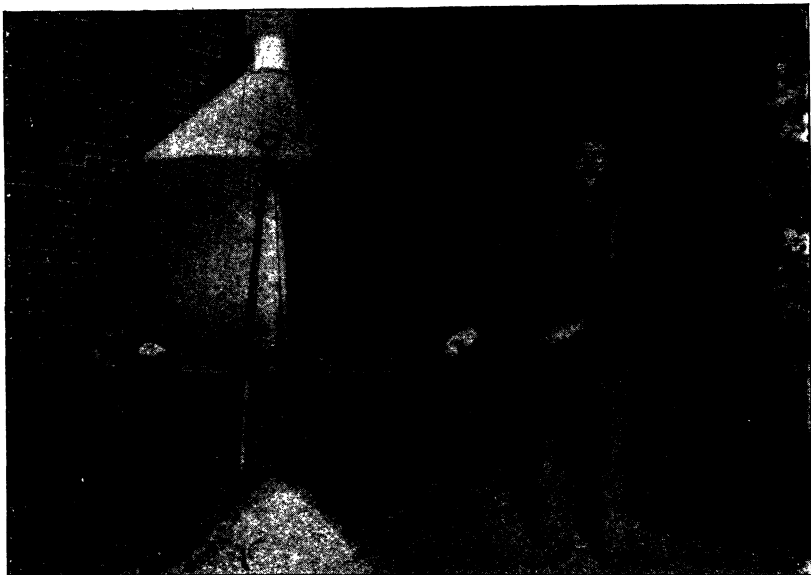
### III. *Suggestions for Improvements:*

The suggestions for improvements which might be made are numerous. Of course the entire plant should be remodeled, and perhaps a new one put up. Aside from this, however, minor improvements could be made which would vastly improve conditions: for example, the provision of some hot drinks and milk at lunch, adequate care of the lunch room, the making of washing obligatory, the provision of more adequate toilet facilities and others of a similar character.

### III. SMELTING, MELTING, REFINING AND CASTING OF LEAD.

A large number of cases of lead poisoning were found in comparatively small factories where lead junk is collected, refined and made into type metal, solder, Babbitt metal and other forms of lead solder. The lead junk is collected from all over the city, and the factories which deal in it are usually about as dirty and ill-kept as any factories that have been found to be using lead in any form. The lead, when it is brought to the lead factory, is stored usually in the immediate proximity of the workers until it is ready to be smelted up. The lead junk is then put into a smelter, where the dross is separated from the pure lead, which is run off from the side of the smelter. (See photo No. 49.) The lead is run into an open tank, usually at the side of the smelter. The worker then ladels it out and runs it into moulds, where it is allowed to harden, and then is piled up near-by. (See photo No. 50.)

In the making of solder usually the lead is melted up in pots or kettles about three (3) feet in diameter. (For example, see photos Nos. 51 and 53.) These kettles, or lead pots, as they are



No. 53.— FACTORY B — LEAD REFINING. Lead pot, showing exhaust and chimney.



No. 54.— FACTORY C — LEAD REFINING. Lead pots. Flashlight picture.









No. 55.— FACTORY D — LEAD REFINING. Lead pots. Ladling molten lead into moulds for solder, etc.



No. 56.— FACTORY D — LEAD REFINING. Victim of lead poisoning — with wrist drop, now employed in sorting scrap metal.





called, are sometimes hooded over and connected with chimneys which are supposed to draw off the fumes, but often they are not hooded at all. In none of the factories inspected were exhaust fans found to be attached to the hoods. The value of the hood is, therefore, probably small. The worker ladels the molten lead from the lead pots and runs it into molds for solder. These molds are shaped so that the lead, when cold, is in long, narrow strips. The solder usually made by these factories contains from 40 to 60 per cent of lead, the remainder being tin.

Other lead alloys, such as type metal and Babbitt metal, are made in practically the same way. Type metal and Babbitt metal have a proportion of lead varying from 25 to 70 per cent, according to the quality of the metal and the work which it is expected to perform. Of all of the factories inspected, only one can be said to have even fair conditions. In the others the sanitary conveniences were of the most primitive sort and sometimes disgustingly dirty. The rooms in which the work is done are usually filled with dust and dirt of every description. In one factory (see photo No. 54) the air was so thick with smoke and dust at the time the investigator visited the plant, about 4 p. m., that the gas had to be lighted, and in order to take flashlight pictures a flash of about twice the ordinary strength had to be used.

The danger of this work comes probably from three sources: First, there is a possibility of the lead poisoning being occasioned by the lead fumes generated from the molten lead. This the writer believes to be negligible. Second, possibility of the contraction of lead poisoning from the hands, which are usually covered with dirt from the lead which the worker is constantly handling. This is no doubt an important source of lead poisoning. Third, and perhaps the most important, is the possibility of lead poisoning through the inhalation of lead oxide. A scum of lead oxide is constantly forming on the surface of the molten lead. The worker is continually drawing aside this scum of lead oxide, and very often takes it from the top of the kettle and throws it on the floor. This scum is usually covered over by a very fine powdery substance, which is pure oxide of lead. No doubt a considerable amount of this oxide is floating about in the

air in the immediate vicinity of the worker and that he must inhale large quantities of it.

In none of the factories in which lead junk was melted up and in which lead alloys, solder, etc., were made, were instructions of any kind ever given the men, or were instructions posted on walls of the factories. Eating was universally permitted in the work-rooms. The superintendents usually permit beer to be brought in at almost any time during the day. Smoking was quite universal among the men. Instances of this sort are shown in photographs Nos. 50 and 56. In none of the factories were towels or soap furnished the men, and the only hot water, and in some cases the only water, furnished for washing purposes was that in the troughs in which the molds are placed in order to cool the lead. In some of the factories there were exhaust fans for changing the air in the room. Such a system of ventilation, however, is almost hopeless in meeting the demands of the situation. In none of these factories was a doctor employed or doctors' services at the disposal of the workers. With the exception of the manufacture of white and red lead these factories are, perhaps, the most dangerous in which lead in any form is used.

#### IV. USE OF LEAD AS A HARDENING AND TEMPERING AGENT.

##### FACTORY A.

*Manufacture of Magnetos.*—The department in which the lead is used is at the back of the building in a sort of shed "lean-to." It is slightly below the level of the ground, about 60 by 10 feet, about 12 feet ceiling. Ventilation is provided for by a fan near the ceiling at one end, and an opening at the other. There are four windows, about three feet by five, along one side. In this room there are five lead pots, the temperature of which varies from 1,400-1,800 degrees. Above these pots are hoods connecting with a 16-inch pipe, which is supposed to lead off all fumes from the pots. This room was hot and dirty; the floor was littered with junk and dirt of various kinds.

The process is hardening the steel magnets after they have been bent in an adjoining room. The magnets, which are horse-shoe in shape, are plunged into a bath of molten lead in one of the





No. 57.— FACTORY E — LEAD REFINING. Brothers who have had lead poisoning melting and refining lead junk.



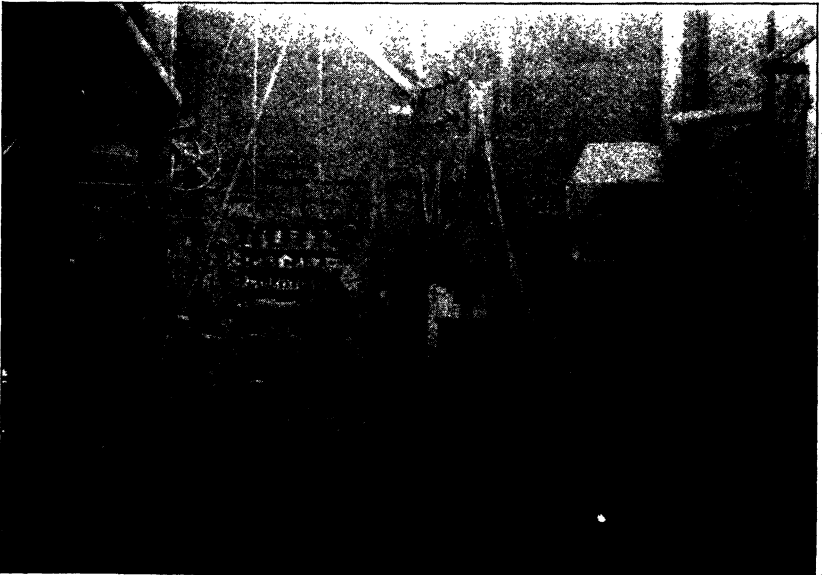
No. 58.— FACTORY E — LEAD REFINING. Same as 57, showing different position.







No. 59.—FACTORY E — LEAD REFINING. Lead pot, with hood, but no exhausts; running molten lead into moulds.



No. 60.—FACTORY E — LEAD REFINING. Drawing solder wire.







pots. Here they remain until red hot. They are then removed by one of the workers and handed to another (see photo No. 61), who plunges them into a barrel of water near-by. They are then cooled and stacked about an upright bar and rubbed with sand-paper, in order to remove adhering bits of lead. There is a possibility here, therefore, of the inhalation of lead fumes, which, however, the writer believes to be slight; the possibility of small particles of lead congealing on the steel magnets as they are taken from the lead bath, and of these flying off into the air is great. This is also true of the rubbing process. A more probable method of infection is by means of the lead oxide, which is constantly forming on the surface of the molten lead. This oxide, which is in the shape of a powder, is easily disseminated through the air and is one of the most dangerous forms of lead. There is no washroom on this floor. The foreman, when asked where the men washed, replied: "At home, I guess." The toilets consist of two dirty, unenclosed seats, totally insufficient. The firm gives no advice on the danger of the occupation, and the foreman, admitting men occasionally got sick, claimed that he didn't know whether it was lead poisoning or not, and "anyway it was only the hard drinkers that got it." (See cases Nos. 20, 21, 22, 23.) No physician or medical advice is provided, and no precautions of any kind are taken. The paymaster stated, on being questioned, that he could give me the addresses of men who had left on account of illness, if the foreman remembered their names. The foreman mentioned the names D— and W—. (See cases Nos. 21 and 22.) Nothing was said of B— (case No. 20), whom the inspector had already visited. The two names were taken to the paymaster, who gave the addresses, which in case of D— prove correct, and in case of W— proved to be wrong. No mention was made of any other cases, although the inspector specifically asked for *all* cases. The paymaster asked, in some surprise, "Why! Is lead dangerous?" The superintendent admitted that nothing was done for these cases of sickness, although in case of accident a small sum of money is occasionally given.

Subsequent to this visit the investigators have proved and interviewed five cases of men who have worked in this plant who have had lead poisoning. One man had died of lead poisoning and a

complication of other causes. In addition the investigators have been given reliable information (which they have not had time to verify) of four other cases. This process has been in operation here just one year. About nine men are required to do the work. Here, therefore, is a department, employing a regular force of nine men and where there have been nine cases of lead poisoning in one year.

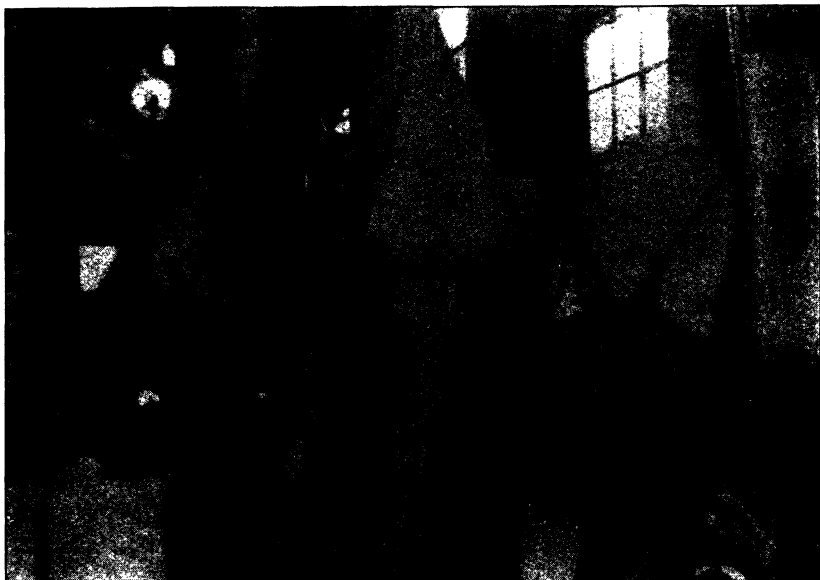
#### FACTORY B.

##### *Lead Used for Tempering Wire:*

In one large establishment where piano wire and springs are made lead is used in several departments as a tempering or hardening agent.

Most of the men coming in contact with the lead are employed in the tempering department. Here the wires are drawn through a furnace, where they are heated to a very high temperature, and then after passing out of the furnace, are passed through a bath of molted lead. This bath of lead is exposed to the air and is about three feet long and one foot wide. The wires are wound off of one set of reels and passed through the lead to another set. The lead oxide, which is constantly forming on the surface of the lead, is scraped away occasionally and allowed to pile up on the machinery or fall to the ground. One man only tends each machine, and it is not necessary for him to remain near the lead for any great length of time. Some of the machines in this room have hoods and exhaust chimneys, and some have not. Where these hoods have not been provided the engineer claimed that the wires which passed just above prevented the construction of hoods. It appeared to the inspector, however, that a very efficient hood could easily be constructed to fit this particular place. The room was ventilated by means of open windows at either side and by means of several overhead skylights. In spite of the large number of windows and skylights, the room was hazy and filled with smoke and fumes.

The superintendent stated that lead poisoning was on the decrease here since the installation of the hoods and skylights. In



No. 61.— FACTORY A — LEAD AS HARDENING AGENT. The hardening room — passing red hot steel from lead pot to water barrel.





spite of this fact, one case, evidently unknown to the superintendent, has come to our attention, and he admitted that he had known of 12 cases in the last five years. There are 60 men employed in this department, in two shifts. The day shift works ten hours for six days a week and the night shift 12 hours for five days a week. Neither shift is given a specific time for meals and they eat as they work.

In another department lead is also used. This is called the patenting furnace. There the wire is run very slowly through a high temperature furnace, and then through a bath of molten lead. In this case the lead is covered by charcoal to a depth of about four to six inches. After passing through the lead the wire passes through water and through pads, which effectually cool and cleanse it of any fine lead particles. The foreman stated that while they once had lead poisoning among the workers in this department, it had almost entirely disappeared since the introduction of the cleaning process. Eighteen men are employed here in two shifts, with hours the same as those in the tempering department.

Another department in which there may be some danger, but in which there is very little, if any, lead used, is that containing the so-called galvanizing furnaces. Here the wire is passed through an acid bath, which prepares it for a coating of spelter. This spelter is confined in a long, narrow basin, exposed to the air. The wire passes through it and comes out coated with spelter, or zinc (principally). It is cleansed of any surplus coating and reeled onto reels. Over most of these basins of molten zinc there were hoods, although some of these hoods were very high above the molten metal.

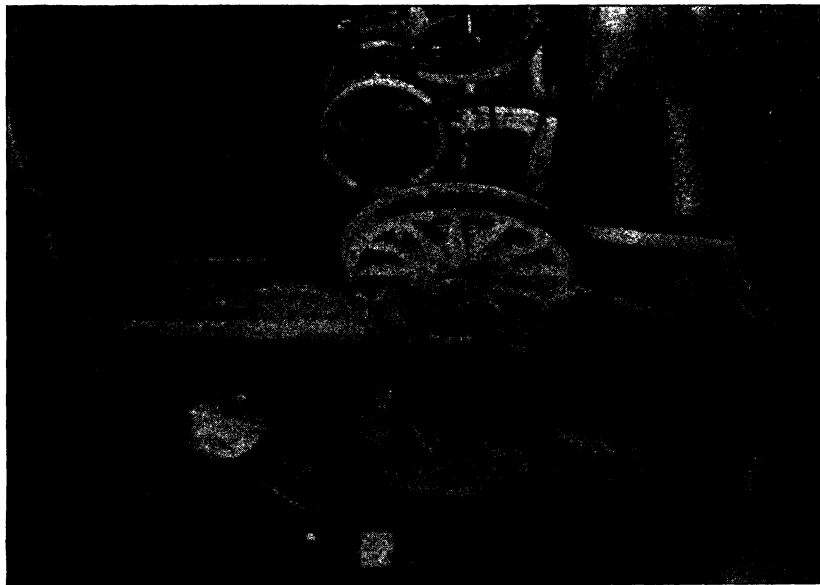
There is no hot water in the wash rooms throughout the plant and, while the toilets are adequate, they are not well kept. There are no adequate washing facilities and no lockers in which the men can keep their clothing. The hoods which are put over the various lead pots, are not provided with exhaust fans and are therefore, almost useless. The generalized method of ventilation merely adds to the danger.

## V. USE OF LEAD SOLDERS.

The only use of lead solders that has been investigated is in connection with the manufacture of tin cans. The use of solder is being displaced in large part by the pressing of the cans and the accurate fitting of one part of the can into another and the pressing of the parts together. The use of solder, however, is still considerable and demands attention. Although no cases of lead poisoning were traced to the can factories, the fact that lead is used, and in a comparatively dangerous form, makes this industry a possible source of infection.

The most prevalent method of soldering tin cans is by the use of a hot iron, heated in a gas furnace, and thus, by means of it, spreading the solder from a small bar along the edge that is required to be soldered. The molten lead is free, therefore, only for a moment, and hardens along the edge of the tin almost immediately. The worker handles the bar of lead continuously and usually his fingers are blackened by the constant contact. However, there is comparatively little danger in this form of soldering.

There is another method of soldering, which, however, seems to need attention. In one factory the inspector found a boy standing continuously over a shallow pool of molten lead. The boy's job was to dip the can, a rather large one, in the solderene (an acid for preparing the surface of the tin for its solder), and then dipping the edge of the can into this bath of molten solder; he then passes it on to another worker, who puts on the bottom of the can. The boy is constantly removing from the surface of the lead bath the collecting skum of lead oxide, which piles up on the bench before him and fall off onto the floor, to be scattered and breathed. The lad could speak no English, and therefore the inspector could not get the desired information as to whether or not he had been affected. Such an open lead bath, small and shallow as it is, is, however, a source of constant danger. In this same factory provisions were made for several other similar pots, which were not going on account of a dull season.



No. 63.—FACTORY A — CARRIAGES. Sand papering the gears.



No. 62.—FACTORY A — CARRIAGES AND AUTOMOBILES. Rubbing down with pumice stone, after painting.







## VI. MISCELLANEOUS INDUSTRIES.

1. *Manufacture of Coaches, Carriages and Automobile Bodies:*

Only a beginning has been made in the study of this industry which will doubtless reveal evidences of lead poisoning when more thoroughly examined. Lead is used in the paints, several coats of which are usually applied in the high grade work, required for coaches and automobiles. These coats are successively rubbed down, in order to give a perfectly even flat surface which is capable of taking a very high polish.

In one of the factories inspected, where a very high grade of work is done, the first coats are put on with a material called "rough stuff," which is composed of 60 parts lead to 80 parts of rotten stone. Several coats of this mixture are applied, and then rubbed down with pumice stone. This is a wet process and no dust whatever is raised. The manager claimed that sandpaper would not give by any means as high a polish or as fine a finish, and that it was used only on second grade work.

In one part of this work the sand papering process was used, namely, on the spokes of the wheels, as shown in photograph number 63. This is not a continuous process, however, as there is not enough of the work to keep a man at it all the time. In fact the man in this picture was posed specially for the picture.

In other carriage factories, especially where repair work is done, the old paint is very often removed by a sandpaper process, in the course of which considerable dust is raised, which is, of course, fatally harmful to the workers.

A very much more detailed study is necessary before more definite conclusions can be reached concerning this industry.

2. *Manufacture of Lead Pipe, Lead Tubing and Solder Wire:*

The processes used in making lead pipe, varying in size from a fraction of an inch to a foot, lead tubing and solder wire, are all similar. The work is done almost entirely by machinery and the workers only handle the metallic lead.

The molten lead is run into a receptacle at the bottom of a hydraulic press. An aperture and mould is left at the top, which

gives the size of the tube which is to be made. The press is then set in operation and the lead is pressed upward through the aperture forming the tube the desired size. In the case of very large tubing, it is sawed off in ten-foot lengths. (See photo No. 21.) In the case of smaller tubes, it is carried high up over a bar and then brought down and coiled around a large drum. (See photo No. 22.)

No cases of lead poisoning were found in this work, although the probability is that a more searching investigation would reveal them.

### 3. *Manufacture of Sheet Lead:*

One factory where sheet lead is manufactured was inspected. The process is a comparatively simple one, and not necessarily dangerous. The lead is first run into considerable sheets, several inches in thickness. These sheets are run between two revolving rollers, until the desired thickness is attained. The sheets are then cut to size by hand, and the remnants chopped to pieces with an axe and returned to the melting pot. No cases of poisoning were found in this work.

### 4. *Manufacture of Lead-Foil and Tin-Foil:*

Two large factories making tin-foil and lead-foil employing 300 and 200 people, about half of whom were women, and many of whom were children, were inspected. Lead is the largest element in the manufacture of ordinary tin-foil and lead-foil. In some foils pure tin is used, but this is very rare, usually there are large proportions of lead, varying from 5-80%.

The pig lead is melted up and cast into slabs about 2½ feet square and one inch in thickness. In one of the factories where the casting is done, there are four lead pots. None of these lead pots are protected by hoods. The room in which the process is carried on is in the basement of the factory and in spite of a large suction fan of probably 42 inches in diameter, the room is badly ventilated and very hot. Most of the men working here seemed to be healthy enough and denied having ever experienced any attacks of lead poisoning. The superintendent, however, was

with the inspector all the time. In the second plant the casting room, although located somewhat below ground, and containing unhooded lead pots, was very light and the air seemed fresh and wholesome. The room was much cleaner than the other and was provided with two exhaust fans. The men here also disclaimed any knowledge of lead poisoning, and also disclaimed any of the symptoms.

From this point in the process, the lead is *always* in metallic form. The slabs of lead after having been cast are sent to the rolling machines where they are rolled between the large rollers set one above the other until they have been reduced to very thin long sheets. The whole process of making the tin-foil becomes from this time forward a process of rollings, each successive operation reducing the thickness of the material.

In the making of bottle tops, a heavy thickness of very pliable lead-foil is used. The lead is drawn into the desired shapes for bottle caps by automatic machines which are tended by young girls. The girls, however, merely handle the sheets of foil as it comes before them, and we are told, occasionally get their fingers under the machinery and cut off.

The tin-foil is colored by machine, and some of it is painted by hand. The colors used are aniline colors, and are less harmful than lead colors, although the aniline has an intoxicating effect. Much of this work is done by young girls.

In one of the factories toilet and washing facilities are provided on every floor of the building. Ventilation throughout the building is merely the ordinary window sort. No lunch room is provided for the employees, and they are permitted to eat wherever they wish. Instructions as to the dangers of the work are neither given personally nor posted. A doctor is employed by the firm who comes to the plant every other day. His work is largely traumatic and he has nothing to do with sickness. Lockers are provided for both men and women. No towels, soap or overalls are provided. No cases of lead poisoning were known to the superintendent.

The second factory has excellent toilet and washing facilities on every floor. Towels and soap are provided, but not overalls. Special attention is given to cleanliness throughout the plant.

The firm has hired a woman whose job is to cook hot things, which the girls themselves provide. This enables them to have a warm lunch. A woman also is hired who has charge of the girls' toilets. In this plant also the superintendent denied any knowledge of any cases of lead poisoning.

A certain chemical compound, the formula for which is a secret, is added to the lead and tin mixture in the molten slabs which tends to give the tin-foil its brilliant appearance. To this chemical may be due the absence of poisoning, for it doubtless prevents in a large measure the oxidation of the lead which would otherwise occur.

#### 5. *Manufacture of Linoleum and Oilcloth:*

At two points in the manufacture of linoleum is lead used. First, in the first process where the linseed oil is boiled, red lead is used as a drying agent. The inspector did not see the worker who regularly did the work, but the superintendent illustrated. The lead oxide dust was scooped out of a barrel and sprinkled over the mixture as it boiled. Doubtless much of this lead got out into the atmosphere.

The second point at which lead was used is in the making of various colored linoleums. The coloring matter is largely made of lead colors, and is ground up with the linseed oil mixture, and comes out and is rolled into sheets, from which various portions are cut and are fitted together, or inlaid, to make the designs which are usually seen in linoleums. A large number of girls and young women work with these materials but there is almost no dust.

The superintendent denied ever having had knowledge of lead poisoning in the factory. However, this factory is almost the sole support of the little and very isolated village in which it is located. No fewer than six cases of lead poisoning from this little town were known at a local hospital — men who, it is almost certain, worked in this factory. Unfortunately no definite information could be obtained concerning them, as they were foreigners who moved rapidly, and only one or two were known at the post-office, and they had not been resident in the

town for many months. Where the cause of lead poisoning is in this factory, it is difficult to say. The most likely place seems to be the sprinkling of the red oxide of lead into the boiling linseed oil. However, so little of this is probably done that there must be some other source of the poisoning which has not been discovered.

#### 6. *Manufacture of Cut Glass:*

The largest factory in the State manufacturing cut glass was inspected with special reference to lead. At one time lead was largely used in the cut glass industry, but it has since very largely disappeared, and while lead poisoning was then very prevalent among glass cutters, it is to-day a great rarity.

After the design has been cut into the glass, a considerable amount of sand remains adhering to the cuts. The glass is then turned over to another set of workers who are usually apprentices, whose work consists of cleaning out thoroughly the cuts originally made. This is done by holding the glass against disks of pumice stone. Under the old process of manufacture the glass then went to a worker seated in front of a revolving brush. On this brush was placed powdered lead and zinc, the purpose of which was to clean thoroughly the cuts made in the glass. During the performance of this process the worker becomes covered with the lead powder. The glass was then further cleaned and polished by being rubbed with a putty which was composed of a large proportion of lead. These processes were used up to about eight years ago when they were superseded by a very much cheaper one. It was discovered at that time that this work of cleaning and polishing could be better accomplished by dipping the pieces of cut glass in solutions of hydrochloric and sulphuric acid. Work which had previously taken a workman half a day could then be done in a few moments. This new process, replacing as it has in almost every shop the older methods, has almost eliminated lead poisoning from the glass industry.

In the large factory employing almost 400 people, which was inspected, the amount of lead formerly used was about 150

pounds monthly; to-day they do not use 150 pounds of lead in three years. Only one man in the entire number now uses lead at all and he is not continuously employed, his work being of a repair nature.

## B. NON-MANUFACTURING INDUSTRIES.

### 1. *Painting and Interior Decorating:*

Almost half of the special cases of lead poisoning collected, and more than were found in any other industry, were those of painters. The number of cases of painters, as shown by the hospital records, which usually record the painter's trade as such, is very large indeed; a small number of painters' unions, which have been visited for information, report an astonishingly high rate of lead poisoning.

The painter's trade is very thoroughly organized. The painters themselves have a very strong organization, which includes the great majority of men in the city who follow that trade. At best, the average painter, and the very good painter, too, has to look forward to two or three months' idleness during every year. The work of the painter, like that of the bricklayer and stone mason, is very casual in character. This is due both to the character of the work done, the hundred and one small jobs, and also to the organization of the industry where a single workman very seldom finds himself steadily attached to one contractor or boss painter.

The kinds of work that a painter is called upon to do may be divided roughly into two classes, (a) exterior and (b) interior work. The interior work again may be repair or renovating work, the reworking of old surfaces, and new work. The exterior work, done as it is in the open air, presents in itself very little danger. The interior work is dangerous. On old work the painter must sandpaper or burn off the old paint. In the first case, he is liable to inhale the dust, which is the dust of lead paint, and therefore carries a high percentage of lead, and in the second case, in burning off the old paint considerable quantities of lead fumes and dust due to scraping are developed. These processes are therefore, perhaps, the most dangerous lead processes. On new work the danger is two-fold; the first is due

to the inhalation of lead fumes from the wet paint. This is not especially dangerous except in a very close and very poorly ventilated room. The second and greatest danger is that on a high grade of work, two or more coats of paint are usually put on and successively sandpapered, in order to give a smooth finish. These sandpapering processes are extremely dangerous. Many of the painters who were interviewed for this study had worked at this grade of work immediately preceding their most serious attacks of lead poisoning.

It is a curious fact that lead poisoning is most prevalent among the highest grade of workmen and that the cheap or low grade painter almost wholly escapes. This is due, in the first place, to the fact that he uses a cheap paint which contains little lead, and in the second, that he simply slaps it on and does not attempt to put on a high-grade finish. The best interior decorators, who do the highest grade of work, are usually most liable to lead poisoning. Many of our cases were traced to the great hotels, club houses and Fifth avenue homes.

The new building, in course of construction, presents some serious problems. Many new buildings, almost all new buildings in a great city like New York, have scores of workmen in them, many more, perhaps, than the average factory. And so far as labor conditions are concerned, they are entirely outside the pale of the law. Except for certain regulations concerning scaffolding and temporary flooring, etc.,<sup>1</sup> there are no laws governing the working conditions in buildings in course of construction. There are probably not less than 75,000 men in New York city working under conditions which are entirely unsupervised by the State and which are usually neglected and unthought of by employers.

The conditions in a building in course of construction are difficult to manage. The very fact that it is in course of construction means that conditions are temporary; that it is a mere shell without conveniences of any sort. Sanitary conveniences are almost impossible; it is difficult to supply water to the different floors; there is also the newness of materials, and the dampness and moisture of a building half open and half closed.

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<sup>1</sup> Labor Law, sections 18, 19, 20 and 21.

Worst of all, everything and everybody is temporary. One group of workmen after another succeed each other, each with its own equipment, which is carried away when it leaves. The very organization of the building industry is a handicap — the builder and owner usually sublets all the different parts of the work, often to contractors who gather a special force of men for this particular job and who have nothing permanent in their business arrangements. Here, therefore, is an industry which is constantly making its conditions, which are continually changing, and to which a constantly shifting group of men are subjected.

The chief difficulties are these: the painters are constantly working with a dangerous poison; they are ignorant of the danger of the poison with which they are working; they are careless in observing the precautions which would lessen the dangers from lead poisoning; most of the precautionary measures are denied the painter because he hasn't warm water in which to wash, he is not provided with washing facilities, nor is there time, especially during the winter months when he gets only a half hour for lunch, to use what facilities there are.

No doubt a large part of the danger could be avoided. If zinc paint instead of lead were used, the danger would be almost eliminated. In France, this will be decreed by law after 1914. The writer has been told that as a matter of fact the zinc paint is no more expensive than white lead, that is, when considered from all points of view. The sandpaper process could be replaced with a wet process using sandpaper and either oil or water. This process is slightly more costly than the dry process. Rooms could easily be fitted up in almost every large building where the painters could keep a change of clothing and have a clean place in which to eat their lunches. Washing facilities could at least be provided on the ground floor. The lunch period is in nearly all cases half an hour. In half an hour it is impossible for a man, with the usual primitive methods at his disposal, to go down several flights of stairs, wash thoroughly, eat a lunch and return to his place of work. At least an hour should be provided for lunch.

The painting trade should be carefully and fully studied as a basis for detailed recommendations.



## CHAPTER IV

### CASES OF LEAD POISONING.

The real gravity of lead poisoning — its effect upon the workers, upon their families, upon the community — cannot be adequately estimated by a description of the disease or by a description of the dangerous processes, or even by a statistical summary of the cases. The following stories, which are the results of a personal conference with the victims of the poison, or in the case of death, with their relatives and friends, give intimate pictures of misery, want and destitution which becomes all the more harrowing when we know that most of it could be prevented. Many of these workers are young men, most of them have families to provide for, many of them have been compelled to remain out of work for weeks and months, some have been permanently incapacitated. The mere loss of efficiency, the mere loss of earning power, should appeal not only to employers, but to the State and to the public at large, as wasteful and unwise, as an extravagant expenditure of human energy and human vitality.

It has not been our aim, in presenting these cases, to draw forth all the harrowing and pathetic details which were all about us, in our visits to almost unfurnished, ragged, poverty-stricken homes. We have sought rather to present in story form the plain bare facts and to allow the reader to draw the picture of the home and the inmates and to draw for himself the conclusions which inevitably follow.

#### I.

#### INDUSTRIAL WORKERS.

##### *Case No. 1.— Paul B—*

Fifty-eight years of age, a Slav, from Austria, where he had been a farmer, came to this country in 1889. It is not clear exactly what he did upon his arrival in America, but before long he found employment in a wire mill where he remained five years.

In 1897 he got a job at a white lead works. He worked there for 14 years and left about Christmas, 1910, because he was no longer able to work. His particular job in the lead works was the stripping of the corroding beds. (See photos Nos. 25 and 28.) This job compelled him to empty the pots of corroded lead. He earned \$12 per week and worked nine hours per day. Nine months after he went to work in the white lead works he had his first attack of lead poisoning, and was out of work a month; at the end of that time he went back to work and worked for five months when he had another attack and was out of work for three weeks. From this time until he left the work he states that he worked only about half the time, and the other half he was disabled on account of lead poisoning.

B— spoke only a few words of English, but an intelligent lad interpreted. As far as could be learned the man had never been instructed, in any way, how to properly care for himself in order to prevent disease. He was accustomed, he said, to wear a handkerchief about his face. He was never given soap or towels. His breakfast usually consisted merely of coffee. So great is his ignorance, even after consulting physicians, that he ascribes the paralysis of his hands to the cold water in which he was accustomed to wash them at the end of his day's work.

The old man — old before his time, is a pitiable figure. He is a physical wreck, his gait is slow and uncertain, his cheeks are sunken and his face pallid. His hands are partially paralyzed. He can lift weights and can move his fingers somewhat, but he cannot put on his coat. He has not, however, the characteristic wrist drop.

He is practically a pauper. He gathers wood from nearby scrap heaps, chops and saws it. A Slav family who have taken pity on him permit him to sleep in a damp cellar and give him the scraps from the table—"Not much," he says. The white lead company has given him nothing. A pensioner of our industrial G. A. R.

*Case No 2.— Stephen H—:*

A young Pole who had been working in the white lead mills for three years, 1908 to 1911. He had had several attacks of lead poisoning and had left the mills a few days before he was seen by the investigator.

*Case No. 3.—George H—:*

He was born in Germany, 1878. He worked in 1901 as watchman for an express company. Since 1902 has worked at a machine factory in the rope department, as a rope mender and janitor. This factory does special work for ships. Last year, 1910, he filled in the mast of one of the ships with white lead, he worked only two days on the job; soon after his left hand became weak and shrunken and he went to the hospital where the doctors told him that he had lead poisoning of the nerves of the hand and arm. He staid in the hospital two weeks, and has used electricity for nearly a year with very little benefit, the arm is slightly better, but the hand does not improve.

*Case No. 4.—Thomas S—:*

Was born in America, 1859, died October 22, 1910. He had worked in the white lead mills for twenty-five years steadily and until within three days of his death he had never been ill enough from the lead poisoning to lose a day's work. Occasionally he had had slight stomach attacks for which he doctored himself with salts. He worked in the cooperage department heading up barrels filled with dry white lead. He was very careful about washing himself before eating and very particular about himself in every way. He drank beer with his meals as he thought that would counteract the lead poison; he smoked a great deal.

The only illnesses Mrs. S— remembered her husband to have had were smallpox in 1901 and pneumonia in 1906. His last illness lasted only three days, and the doctor at first thought it appendicitis, but decided later that it was lead colic, and death was due to internal hemorrhage.

*Case No. 5.—Peter P—:*

Three months, August, September and October, 1910, were enough to give Peter P—, a "mixer" for a white lead company, a dose of lead poisoning severe enough to make him leave the industry. He is now picking up a precarious living as a longshoreman on the Brooklyn docks. His total weekly income averages about \$7.50, but his health is safe, and at any rate he received only \$8.85 from the lead company.

Coming fresh from the farms of his native Lithuania, P— landed here in 1909. He is a well-built, bright-eyed, intelligent man. Only the bar of language prevents his making his mark in America. For a few months after landing he worked as a longshoreman, his present occupation. His pay was then \$5 or \$6 per week, according to the way work ran — some days he put in twelve hours, some only two; about forty hours a week was the average. He had only half an hour for dinner, and was almost certain of being unemployed a day or two of every week; but at any rate he never was ill.

From sometime in the fall of 1909, until August, 1910, P— was on the payroll of a large sugar company.

P's— third American job was a bad one. For sometime in August, 1910, to the end of October, he stood for ten hours a day, nine hours on Saturday, over a great iron mixing bowl, in which water, oil and white lead were being kneaded to make the white lead to be used for ship-building and painting. The workers have to pour in the ingredients, supervise the mixing process, and take out the finished product. Before the three months were up, P— was incapacitated. Severe cramps and colic and a slight headache fastened on him and kept him from work. This and the consequent weakness lasted two full months, at the end of which time, being again able to work, he became a farm hand on the outskirts of Brooklyn. Here, in a little place on R— Street, he did chores and tended live-stock from December, 1910, until the following May, for \$18 per month and his keep. In May he returned to the docks, where he now is, as described above.

The effect of the lead poisoning, which was so diagnosed by the company's doctor, seems now to be gone, except that P— complains that he is not as strong as before the attack. He looks, however, perfectly well.

P— says no instructions for care or cleanliness were ever given him in the lead shop, and that he never saw any instructions posted. His customary breakfast is meat, potatoes, bread and coffee. He uses no tobacco at all, and only one glass of beer daily with meals. While in the lead factory,

he regularly came home to dinner at noon, living only a block or two from the shop, and did not eat in the workroom. At home he found a plentiful supply of hot water, which he used for washing his hands. He changed all his clothing except underwear at the factory; wears a mustache but no beard. The company provided a hot and cold water supply, and a doctor, but took no other precautions for their men, he says.

*Case No. 6 — Julius S—:*

Living in the same apartment with Peter P—, previously described, we found Julius S—, a young man of 21, whose experience was at all points almost similar.

S— also was born in Lithuania, in the same village as P—. He came here in 1909, and has spent the two years in Brooklyn. His first job in this country was with a white lead company. He was a stripper; that is, he stacked the steel "buckles" in jars, in tiers in the corroding room, and then at the end of the allotted 100 days went around and "stripped" or emptied the pots into little cars, to be hauled away to the next process. (See photos Nos. 14, 15 and 16.) This is one of the most dangerous jobs in the plant, and S— held it about nineteen months, January, 1910, to July 1, 1911. Toward the end of this period he used to lose about three days every month due to colic, nausea and vomiting, and when his wrists began to show signs of paralysis he left the lead company and is now employed on the docks at casual labor.

While in the lead company's employ, S's— pay was \$9.60 weekly, for 59 hours' work. He had only half an hour for dinner. Now his pay varies from \$2 to \$5 per week, and his daily hours vary from 1 to 6; but he has a full hour for dinner, is in the open air, and is gradually recovering from the chronic stomach trouble which his lead experience gave him. In Europe he was a farmer and a herdsman, and was never sick.

S— is unmarried. He says no one gave him any information or showed him any notice about the care of his person in the lead plant. Meat, bread and coffee formed his breakfast, and he consumed daily five cigarettes and two or three glasses

of beer. He also came home to dinner from the shop, and washed his hands at home in hot water. His clothing he changed at the shop. He wears a mustache and no beard.

All the precautions he knew of at the plant were hot and cold water and a doctor. He did not venture to suggest what might be added. The diagnosis of lead poisoning was made by the company's physician, and chronic stomach trouble still clings to this man.

*Case No. 7.—Franz S—:*

Is the father of Julius S—, just described. He was not seen because he has now returned to Europe, realizing that America was "no good" for him, but his son furnished full information.

Franz was the first of the two to come to this country. He arrived from Lithuania, where he had been a cattle herder and horseman, in 1908; he at once secured work with a white lead company, and the following year sent for his son.

The father was no more fortunate than the son. He also was a stripper, in the corroding beds of the lead plant. His pay was \$9.60, his hours ten a day, nine on Saturday, with half an hour for dinner. At this job, the only one he ever held in America, he stayed about three years. He lost from two to four days every month from lead colic, headache and vomiting spells; his wrists also began to grow weak and numb. Finally, in October, 1911, three months after his son left the lead works for the docks, the older man sailed back to his family and his native land. He is now reported to be doing well.

According to the son, no warnings or instructions were given to his father in the shop any more than to himself. The older man wore a mustache, but no beard, never touched either alcohol or tobacco, always washed in hot water before eating, and made a regular breakfast on coffee and rolls. He came home for dinner, and there is no indication of any non-industrial cause for his illness. In his case, also, it was the factory physician who made the diagnosis of the lead poisoning.

*Case No. 8.—Samuel B—:*

The neighborhood, about two of the plants which are located near together, is filled with lead poisoning cases. One can hardly walk without stumbling into them. A map dotted with a red pin for every case would look like the tuberculosis map of the New York "Lung Block." Thus the three cases just recounted were all found at the same address, and in the same apartment.

While searching another house, only a block away from the place where the last three cases were found, for a man whose record we had, but who seemed to have moved and left no trace, the present case was located. Samuel B— is a huge, pallid-faced youth, with only a few words of English at his command. His wife, smaller, bright-eyed and vivacious, acted as interpreter, and when she had done this service, piloted the investigator two doors further up the street, to the home of a fellow workman of her husband's, who had been down with the colic just the week previous.

B— was born in Poland, 1885, his parents being Polish Catholics, of the town of Prasniz. There at the age of fourteen Samuel started to learn the trade of carriage making. He confined himself entirely to the wood-working part of this industry, turning out parts for the vehicles, and assembling them, but never doing any painting on them. He kept at this work for eight years, earning \$2 (4 rubles) a week, for twelve hours a day, seventy-two per week, with one hour off for dinner. He lost no time, either through illness or slack work.

In July, 1907, B— came to America, and at once went into the employ of the white lead company, where he became a stripper. A stripper's duties are to stack the lead buckles in jars over weak acetic acid, and stack these jars in tiers in long rooms, the floors of which are spread with tan-bark. When the corrosion has suitably advanced, after 100 days or so, the stripper takes down the stacks and empties out the white lead which has formed in crumbly cakes and powder. B—'s pay for this work was \$9.60 per week, for 59 hours. He was given only the inadequate time of half an hour for dinner. He lost no time through slack work, but every year was incapacitated from one to two weeks.

The nature of the incapacity was the usual one with lead workers; severe cramps, colic, constipation, vomiting and loss of appetite. B— has been in this place now for four years, and has had four separate attacks, all with the identical symptoms. These attacks came from eight to sixteen months apart, and lasted each from five to fourteen days.

This workman married in 1908, while working at lead. He has since had two children, a boy and a girl, who look pale and ill-nourished, as would be expected when the pettiness of his pay is considered, but show no specific signs of lead poisoning. His wife, 22 years old, is plump and wholesome.

"No!" was the answer of both B— and his wife when asked about warnings or signs in the factory. He does not eat there, coming home to dinner. At meals he drinks two glasses of beer per day; he chews almost continuously, and every day smokes from five to ten cigarettes. Two cups of coffee make up his breakfast. He "sometimes" washes before eating, in cold water, and does not change his clothes either in the factory or at home. He is clean-shaven.

The factory doctor made the lead poisoning diagnosis. He knows of no permanent effect from his many attacks, but his face is pale almost to lividness, marking probable an extreme anemia.

*Case No. 9.— Paulus M—:*

This is the man to whom the wife of B— led the investigator when she had completed her husband's record.

He is a much different type of a man, smaller, more energetic, and also more nervous. He also works in the plant of a white lead company, where he is a furnace hand. His duties, as near as they could be made out from his gesticulating description, are to put the lead pigs into a melting pot, stir them up, skim off the dross, and run the lead out into the flat "buckles," of which the white lead is made. He works alternate weeks on the day and night shift. On the day shift he puts in ten hours daily, nine on Saturday, and gets \$12 per week. On the night shift he gets \$13.20, but has to put in thirteen hours a night to get it. On



both shifts his lunch time is one-half hour. About two weeks a year are lost through slack time.

M— has held his present job ever since coming to the country, in October, 1903. For five years he withstood the dangers of his occupation. Suddenly, in 1909, he was taken with terrible headaches, cramps, weight on chest, constipation and stiffness of the legs. This lasted a week. He took medical treatment and worked about a year before he had another attack. In 1910, however, he lost another week in the same way. In the present year he has lost four weeks at various times, and to the foregoing symptoms has been added a doubling up of the fingers, which he cannot straighten. When interviewed on December 18, 1911, he had just lost from Monday to Saturday of the preceding week through an attack. He showed the investigator a bottle of medicine bearing the name of the company doctor, and told of his conversation with the latter about staying out of work for the week. Yet this man's name was not on a list furnished by the physician, and said by him to contain all the cases he had had during the year.

M— was born in Poland in 1872. From 1889 to August, 1903, he worked on his father's farm, the usual "stint" being from ten to sixteen hours. He reports no illness during this period. He married in 1900. His wife was born in 1872, and has had four children. The third of these, a girl, was born in 1905, and died the same year of summer complaint. The other three are alive and fairly healthy.

No instructions were given him, he says, on going to work in the plant, and he knows of no warning notices. Bread, butter and coffee are his breakfast; he uses no tobacco, but takes a glass or two of beer daily. He comes home to dinner, and washes in hot water before sitting down to the table. He also is careful to change his clothes in the factory. He has a mustache and no beard. The doctor and hot and cold water are the only factory precautions he knows to be in use; wash rooms, lunch rooms, soap and towels he thinks would be good things.

The company physician diagnosed this man's case as lead poisoning. Weakness and anemia are the results of his repeated attacks.

*Case No. 10.—Nathan G—:*

On February 27, 1910, the hospital ambulance clattered up to a house on W— street, Brooklyn. The ambulance surgeon found Nathan G— suffering from acute lead poisoning, but after treating him, advised the victim to wait a day and then walk to the hospital himself if he was still in pain.

This program was followed; on February 28th G— was admitted to the hospital, remained there until March 7th, and was discharged "recovered but anemic." The attack had in fact begun in a mild form two weeks before; then came an interval of quiescence, and finally the crucial pain that led to the ambulance call. No lead line was found on the patient's gums by the hospital staff, but his case was definitely set down as lead poisoning.

G— seems to be a sort of rolling stone in industry, having had innumerable jobs, keeping each but a short while. Tailoring, shoemaking and harnessmaking are his main lines; the cobbler's trade he learned in Poland, between 1895 and 1903, and has now for a time resumed it. On these casual jobs he earns from \$6 to \$9 or \$10 per week.

It was in December, 1909, that he became a white lead worker. At his job he was called a "mixer," i. e., he mixed the lead carbonate with oil and water to make the commercial white lead. In the three months or less that followed he got his "leading." He left the white lead works for the hospital, and has never gone back. At present he is cobbling shoes on 42d street, New York.

While in the white lead works G— got \$9.60 per week for 59 hours, with a half hour for dinner. His symptoms when taken ill were cramps, colic, vomiting and loss of appetite. He is unmarried. He says he was instructed in the factory to be careful to wash his hands and keep out of the dust all he could. He remembers no notices on the walls. His breakfast consisted of coffee and rolls; two or three glasses of beer a day is his allowance, with a finger of whisky occasionally, and he smokes about ten cigarettes daily. He disregarded, it seems, the warning to wash, and very seldom cleaned his hands before dinner, for which he used to come home from the shop. He wears a mustache, but

no beard. He speaks of lockers for the men's clothing in the plant.

He was born in Poland in 1883, came to America in 1903, and has lived all eight years in New York and Brooklyn.

*Case No. 11.—Alex P—:*

This man was found at his home, two blocks away from this lead factory where he was poisoned, while the investigator was looking for another victim of lead in the same house.

P—, while of middle age, is pale, sallow and hollow-chested, almost a wreck; but the most interesting thing about his case is that of his eight children, the four born in 1903, 1904, 1905 and 1906, respectively, were either born dead or died of inanition in the first half week of their lives. The mother, an over-fleshy person below middle height, does not seem to have any of the symptoms of lead poisoning, but the four successive infant fatalities are very significant. All four deaths occurred while the father was working as a stripper in the white lead works.

The father has had two distinct and emphatic attacks of plumbism. The first, in November, 1910, kept him in bed for two weeks. He recovered under treatment, returned to stripping, and four months later, in March, 1911, was brought down with a more malignant attack. This time he again spent two weeks in bed, but was compelled to remain out of work, convalescing, for six weeks longer, so slowly did his strength return. His weight fell from 160 to 140 pounds.

This worker is a Catholic, born in Poland in 1871. At the age of 12 he began working on his father's farm, in the village of Braznis. He stayed there for eight years, and in November, 1891, came to America. On this side he first found work in the cooperage plant at Bayonne, N. J.

Moving in 1897, to Brooklyn, this man worked fourteen years, until March, 1911, as a stacker and stripper for a white lead company. This is the most dangerous part of the white lead process, but P— seems to have withstood it a long time. Finally, in November, 1910, he came down with a terrible case of colic, semi-paralysis of hands and feet, terribly swollen legs and

hands, and excruciating pains all over the body. Not taking warning by the experience, he returned to the corroding beds after two weeks' illness, and in March was seized with the attack which finally made him realize that that shop was no place for him. The seizure was identical with the first, except that it weakened him more, and he was full two months getting on his feet again.

While at this poisonous work P—'s pay was \$12 per week for 59 hours' work, with a half hour for lunch.

From May till August, 1911, the convalescent was unable to find employment. In the latter month he was taken on as a porter in an office building, on lower Broadway. Here he sweeps and washes floor, polishes brass fixtures and other coarse work. His hours are twelve a day, seventy-two a week, with one hour for lunch; pay, \$10.

P—'s wife was born in 1878. Besides the four children who have been mentioned as dying within four days after birth, and who were all boys, she has had four more, all of whom are alive and of fair physique, perhaps somewhat inclined to over-fleshiness, like their mother, with the exception of the one boy, who is small and "old" looking. The girls are 16, 12, 10, respectively, the boy 13.

Instructions were given to the man for taking care of himself in the shop, but he says he saw no signs. His regular breakfast was coffee, bread and butter. He does not drink at all, and smokes only one paper of tobacco a week, in corn-cob pipe. He always came home to dinner, and washed his hands in hot water. He changed his clothes in the factory, and wears a mustache but no beard.

In the factory were hot and cold water, respirators for some of the men, and a doctor. He would have liked to have added lunch rooms, wash rooms, decent toilets and lockers.

#### *Case No. 12.—Thaddeus K—:*

Living in the same miserable cellar single-room apartment, sleeping in the same bed with his friend Milkas, Thaddeus K— was discovered, as ex-employee of a lead company.

K— is now lugging sugar barrels on the Brooklyn docks for from \$10 to \$12 per week of about 63 hours on the average.

His statement that he gets only one-half hour for dinner is at variance with that of other lead victims now working on the docks. Perhaps he cuts his meal hour down in order to put in over-time. Before going on the docks this man worked for five years, from August, 1906, to October, 1911, with several short interruptions, as a stacker and stripper in the corroding beds of the white lead plant. His pay during this time was \$9.60 for 59 hours per week, one-half hour for dinner. From the time of his immigration, May 1905, until becoming a lead worker later in the same year, K— worked on the sugar docks, 60 hours weekly, for about \$9.50.

During his lead factory life this man had two acute attacks of lead illness, one in 1910, costing him two weeks' work, and one in 1911, costing him three weeks' work. The symptoms both times were the same: arms and fingers partly paralyzed, pains in head and stomach, muscular and articular pains in the legs and especially in the knees.

While married six years, this man has no children, having left his wife behind when he came over, the very year of his marriage. No instructions as to personal care were given him or posted in the lead factory that he knows of. Coffee, bread and sometimes meat made his breakfast, and the same, with two or three glasses of beer, made his supper. He never uses tobacco. Lunch was taken in the work-room, and was always preceded by a thorough washing in cold water, the only kind the factory provided. He always changed his outer clothing before leaving the factory. No other than an industrial cause can be held responsible for this man's illness.

*Case No. 13.—Frank W—:*

Coming from St. Philips' Parish, Barbadoes, where he had been a school teacher, to New York in 1906, Frank W—, a negro, found work at a factory where red lead or lead oxide is made, and stayed there nearly five years, until he was so thoroughly leaded that he could not stand it any longer. Then he left it and has been unemployed ever since.

W— was a porter at the lead works; he carried bundles of dry lead from the shop to the delivery trucks outside. Once in a

while he did some packing and wrapping, but this was not his work. At the beginning of his employment there he got \$9 per week, later \$12, the time remained 59 hours per week, 10 per day, one-half hour for dinner.

W—'s lead poisoning showed itself by cramps in the stomach, weakness of the wrists and fingers, also of the ankles and legs, and vomiting. He had three acute attacks, losing thereby one week in 1908, two years after beginning the work, two weeks in 1910, and two weeks more in May, 1911, when he decided to leave the industry.

He has one child, a girl, born this year, who, he says, is sound and well.

W— is a very well-read and intelligent man, a West Indian negro of culture. How he comes to be working in a lead factory is quite inexplicable. He conversed freely in excellent English about the plant and its conditions. According to him, he was carefully warned how to care for and clean himself from the lead, and he says the whole factory is placarded with warning notices. Before going to work this man used always to breakfast on coffee, eggs and bread; once in a while, very rarely, he smokes a cigar or takes a little beer. Most of the time he ate in the work-room, washing his hands with warm water and soap powder, and changed his clothes before leaving the shop. He is clean shaven.

According to W—, the lead factory is fitted with ventilation hoods, exhaust fans, wash-rooms, soap, towels, hot and cold water, lockers and respirators, besides a doctor; perhaps the fact that he was not in the actual manufacturing part of the plant gave him superior accommodations to those of the majority of the employees.

His case was diagnosed as lead poisoning by the company's physician. The only after-effect is a long-continued weakness.

*Case No 1. — Thomas O—:*

He is a young man of 22, a Polish Catholic, round-faced and rather ruddy. He has been in this country only since August, 1911, and all that time has worked at the docks of a lead company. He became badly frightened as the investigation pro-

gressed, and seemed like a man who has told something he was ordered to keep secret. Some other men employed by this same company, and visited the same day as he, refused to talk at all, and even tried to conceal their identity when they found out what was wanted.

In Poland O— was a farmer. Here, since August, his work has been to unload lead pigs from the barges tied up at the company's docks, and load them into wagons, which cart them to one or the other of the company's plants. He works ten hours a day, 59 hours per week, one-half hour for dinner, and receives \$9.60. He has lost no time on account of illness, but has complained of pains in stomach and loss of appetite. These symptoms were strongest early last November, and he has at present a bottle of medicine bearing the name of the company's physician, who, he says, minimized his ailment and said that it would "soon go away."

The young man is unmarried. He says he was not instructed in care of the person at the shop, and never saw any notices doing so. His ordinary breakfast consists of meat and potatoes; he touches neither tobacco nor alcohol in any form. He comes home from the shop to dinner, and washes in cold water before eating. He changes his clothes at home at night, after work, and is clean shaven. Cold water and a doctor are all the precautions the factory takes, he says.

In his case lead must have been taken into the system, if at all, by putting the hands to the mouth after handling the lead pigs, with their fine coatings of oxide.

*Case No. 15.— Antonio M—:*

M— was born in Italy in 1878; came to America in 1897. In 1907 he married an Italian girl who came to America when she was two years old. The couple have had two children, one of whom is dead; the baby, a boy of two, is well and strong. A— worked in the white lead mills in 1902, and later came back to the mills three years ago, 1908. He has worked there, off and on, during the last three years. Three months ago he went to the hospital with wrist-drop in both hands and general weakness; he

stayed there two months and then came home stronger, but the hands were unimproved. He is thin but has a good color and seems strong; his teeth are good and he has a slight blue line on the gums; his hands, however, make him quite helpless.

Mrs. M— is working in a handkerchief factory, where she earns \$5 per week, on which the family live.

*Case No 16.— John S—:*

This man came to this country in the month of October, 1902. He is a Pole, from Russia-Poland, and is 35 years of age. He has been married seven years and has three children, bright youngsters they are, too, two boys and a girl.

The investigator found him one sharp, cold Sunday, huddled over the oven of a cook stove, which was one of the few articles of furniture in a single room where he lived. His face was white and drawn, he was bent over like an old man, but despite the deadening disease, a man of considerable aggressiveness, intelligence and vigor could be distinguished. When he first came to this country he worked for the S— Co., and he stayed there over five and one-half years. He then, probably for the higher wages which this work offered, went to a white lead factory, where he went to work in the drying room (see photo No. 4), and he received \$13.50 per week. His work consisted of raking over the white lead, as it stood in solution in the drying pans (see photo No. 4) and shoveling it into the automatic conveyor, when it was dry. S— worked here for eight months, when he was taken sick with lead poisoning and was out of work on that account for three months. He went back to the dry room, and in three months he again had a severe attack. This time he was out for two months, and spent about 15 days at Bellevue Hospital. Again he went back to the lead works, this time he was given a handy job about the yard, which he held for 11 months, without any bad effects, when he was transferred to the lead presser. He was only on this job for two months when he was again stricken and out of work for four months.

It seems strange to us, perhaps, that a man will continue at a work which has caused him much misery, but we find this man



going back to it even another time. This time he took a job as furnaceman, on the oxidizing furnaces. Here his job was to rake over the lead in the furnace. He was subjected to both the dust and the fumes of the burning lead. After nine months at this work, he was again leaded, and has not been able to work since, which, at the time of writing, is three weeks.

This man's loss of wages since he started to work for the lead company, in May, 1908, has amounted to almost \$500, out of a yearly wage of, at best, slightly over \$600.

The superintendent of this factory told the inspector that when a man showed the first sign of being leaded he was told to seek work elsewhere, and yet this man has been allowed to return time and time again. In fact, he has been invited to return, and in the last week two messengers have been sent to ask him to come back to work.

*Case No. 17 — John K—:*

This man, in the factory, goes under the name of "John M—," because they can't spell his name, is a Russian-Pole, who has been in this country since 1904. Evidently he was prosperous at first and got married almost at once. He has one little girl, six years old, and a baby, born only two months ago, died within two weeks of the birth. John was at that time in the lead works. He is only 25 years of age.

Before working as a lead worker he had held a large number of jobs, the oil works, box factory, etc., but had never been sick. In August, 1911, however, he went to the lead company, where he was employed in the presser. Here he earned a little more than he had ever earned before, \$12 per week. The S— Co. thought he was only worth \$10.50. In November, after working in the lead three months, he had a severe attack of lead colic and was out a week, but went back to the job. A month later he had another attack, and then, as he said, he "chucked the job." A month later, however (January 7) he had still marked evidences of his leaded condition. His hands were still weak, his appearance anemic and he was still unemployed.

At the factory he was never instructed as to the dangers. He says he saw placards in the plant, which he thinks were instructions, but he could not read them. He drinks moderately. He was permitted to eat where he worked and did not always get a chance to wash, and then only with cold water.

John says he is not going back to that job again.

*Case No. 18.—Frank P—:*

He came to America from Russia-Poland in 1901. He married in 1906. He has four stepchildren and a daughter of his own. He is 30 years of age.

After having had a number of jobs, in various places, mostly in Long Island City, he went to work for a white lead company. His job was at the press. Here he worked for six months, when he was seized with his first attack of lead poisoning, and was out for two months. Again he went back to the same job, and he was again taken down with the poison. This time he lost about two weeks' work. He is back on the job working at the press, where he has now been for about four months. He has a lead line on the gums which is very marked and his wife says he has constantly recurring attacks of a serious character.

Like the other workmen in this plant, P— has not been instructed or warned. He smokes little, drinks a little, eats almost no breakfast, and is doing nothing of a definite character to prevent a recurrence of the attacks. He can't speak much English, but is bright and intelligent, and would doubtless be able to comprehend the dangers and properly safeguard himself if he was properly instructed in his own language.

*Case No. 19.—Aleck P—:*

Aleck is a brother of Frank of the same name, whose case is given as No. 18. He has not yet been in this country a year, is a fine young fellow, age 21 years, but with almost no knowledge of English.

The first job he got when he came to this country was as a stripper of the corroding beds of a white lead factory. (See photos, 2 and 2b.) He got \$10.50 at this work, a considerable

wage for him, and he held his job for two months. He was then taken with a slight attack of lead colic, which kept him out of work for about a week. Aleck then got a job on a farm, where he only earned \$15 a month, but where he regained his health, as is evident from his healthy color. He came back from the farm and found work at a terra cotta works, where he says he did everything around the place, and was healthy at it, but he only got \$9, and that \$10.50 at the lead works worried him, and so he is back there again now, has been working there one week. He is not working on the corroding beds, but is packing red lead in barrels. (See photo No. 11.) He shows no signs of being leaded. He has a perfectly healthy, even ruddy, complexion, but in view of his previous slight attack of colic, it is only a question of time at this job until he will again be leaded and will be as sick a man as his brother.

He has been given no instructions, drinks a little, smokes a little. His breakfast consists of cakes and coffee. He eats his lunch where he works, sometimes after washing, sometimes not; all he has to wash with is cold water.

*Case No. 20.—Leonard B—:*

He is at present experiencing a bad attack of lead poisoning, which he contracted while under the employ of a company manufacturing magnetos. Mr. B— is a married man, 46 years of age, and has five children. These children are all in school except one. Mr. and Mrs. B— have been married 19 years. They are of German parentage. Mr. B— came to the United States 29 years ago; Mrs. B. 25 years ago. Mr. B— left the factory on June 24th last (1911), when he was so leaded that it was impossible for him to work. He was with the company for seventeen months. His work during most of this time was "hardening magnetos," a process which consists of plunging the piece of steel into molten lead, heated to a very high temperature (he says over 1,400 degrees), holding the magneto in the hot lead for a few seconds, and then taking it out and plunging it into a barrel of water. While standing over the fumes one inhales them, both through the mouth and nose. Mr. B—'s teeth are spoiled and his gums are in a bad condition. During the first 12 months

of this work he was in a large upstairs room, where there were many windows, and these were all kept open, and where the work was done with gas, not lead. At that time he said he had no trouble, but later when this work was moved downstairs into a smaller room, where there was practically no ventilation, several of the workers experienced severe attacks of lead poisoning — one of the victims, he thinks, is dying. When he felt the effects of the lead he asked for other work — he then tried matching magnetos together, but this kept him in the same room, and his arms were soon in such a condition that it was impossible for him to use them.

His attack commenced with vomiting — now his wrists and hands are almost useless. After he left, some exhaust pipes were put in, but he thinks they are not giving satisfaction. He has improved much, so that he now holds a position as night watchman. He is on duty from 5 p. m. to 7 a. m., but says he can sit quietly most of the time. For this he receives \$2 per night; when employed by the magneto company he received \$2.50 per day, a nine hour day, working six days a week, with the exception of the hottest weather, when the plant was closed on Saturday afternoons. Twice he has been back to the company since he left, to see if they would do anything for him. He hoped they would make him a loan, and that he could work it out later. They told him there was no use in his coming there if he could not work. He showed them his condition — they told him he ought not to have come there to work at all if he could not stand it. He says he was in good health before this — that he weighed 194 pounds when he went to work in the factory; now he weighs 154 pounds. He smokes a pipe after his meals, but uses tobacco in no other form. He drank some beer occasionally with his lunch, but has no money for beer now. While he was employed in the factory they allowed him one-half hour for lunch; this was brought to him from home, and was sometimes hot. He ate outside, sitting on the ground against the fence. He has no trade, and has never been employed in connection with lead at any other time in his life. For three months previous to the period of his employment with the magneto company he was employed in driving a coal truck.

*Case No. 21.—William D—:*

D— was born in 1875, and his wife in 1876. They have six children, from three weeks to ten years of age. Mrs. D— has had no miscarriages. During the time that he was employed at the lead works he earned \$15 per week. Previous to his employment at the magneto factory he was for almost two years in positions where he came more or less in contact with lead. For a couple of weeks before getting this job he was a sealer on a railroad where he used lead solder. However, the conditions were sanitary, ventilation ample when working indoors. He had no effects from the lead whatever. Previous to this he was employed as a foreman in a metal working factory, where he had about 18 men under him.

He smokes and drinks occasionally and uses whiskey when he feels like it. He is not a hard drinker. He wore a mustache at the time of the interview. He was evidently in a weakened condition and showed a trace of the lead line; his complexion was sal-low and his face and fingers thin.

D— went to work in the magneto factory early in March, 1911. He was put to work in the hardening room, where his work consisted of putting bent bars of steel into a bath of molten lead. There were five lead pots in the room, which were heated to different temperatures according to the temper desired. After having been heated a sufficient length of time, he would remove the red hot bars from the bath of molten lead, pass them over to another man, who immersed them in a barrel of water, which stood nearby. They were then passed on to a third man, who tested them by knocking sharply on them with a steel rod. Another man rubbed them vigorously after they had been piled one upon another about a wooden tree, in order to remove any remaining particles. When D— first went to work here there were no hoods over the lead pots, such as are to be seen in photograph No. 61. In fact, he helped to put up these hoods. The room in which the work was done is a long, low room, a sort of a shed, slightly below the surface of the ground. It is about sixty feet long and about eight feet wide. There are four windows, about five feet by three, along one side. There is a fan near the

ceiling at one end, and an opening at the other. The roof is raised about one foot to let out the air. On the whole, however, on account of the intense heat, the furnaces, oil-fed under 11 pounds pressure, varying from 1,400-1,800 degrees, the room was poorly ventilated.

D— was not warned of any dangers in connection with the work. In fact, when other men became ill, he was told that their illness was caused by the heat.

Although he shortly began to feel ill, he declared that he had never let a job get the best of him before, and he decided to stick to it. This he did. He also states that he hoped for promotion, which was held out to him. Early in June he was taken sick and remained at home for a day and a half. He could keep nothing in his stomach and had severe cramps. He returned to work and was put on a different job for a couple of days, but when he was slightly better he was again sent to the lead pots. He tried another week, and then he was laid up with another very severe attack which lasted a week. The symptoms were the same. The ordinary remedies which he secured at the druggists were of no avail. He had not consulted a doctor. At the end of this week he returned to work, but stayed at it only a day and a half, when he was forced to leave on account of his condition (July 6, 1911). Meanwhile he had informed himself of the nature of his disease and decided to leave before getting any worse. He then consulted a doctor, who confirmed his belief that he had lead poisoning. When D— entered the job he weighed about 180 pounds; when he left, scarcely four months later, he weighed 128 pounds. He had a distinct and heavy lead line on the gums; was weak and unable to do any effective work. Until September 29th he was unemployed, largely because his physical condition made it impossible. He then went to work in some brick work, which he found so difficult that he had to give it up. He is now doing odd jobs, such as insurance collector; because of this illness he has failed to get a job as a waiter, because his appearance led people to believe he had consumption.

Mr. D— is a man of evidently more than usual mental calibre, and knows what he is talking about. His testimony was straight and concise.

*Case No. 22.—Willis W—:*

An American, of native parentage, he was born in 1863. During his young manhood he followed the sea. Later he gave up climbing masts and halyards and climbed the frames of great steel buildings. He began as a structural iron worker in those days when structural iron workers made only \$2.75 per day. In the spring of 1910 he became mate on a little tug boat plying the Harlem river, and from this job, early in April, he went to work for the magneto factory. His work there was in the hardening room, where he put the steel magnetos into a bath of molten lead, and when they were white-hot, withdrew them and plunged them into a barrel of water. From the first he recognized the dangers and guarded against them. He took epsom salts every other day. In spite of his precautions he lost weight, falling from 212 pounds to 174; he also lost his appetite. Early in July he was taken with severe pains in the lower part of the abdomen and went home for half a day. After two or three weeks he had another attack, this time very much more severe, and he remained at home and in bed for 3½ days. He then went back to work for only a few days. He was not entirely incapacitated, but was considerably weakened. In fact when the investigator saw him some six months later he had only partially recovered his weight and vigor.

Before his attacks W— helped to erect hoods which now protect these pots, and also to put in the exhaust ventilating fan and to raise the roof. These changes bettered conditions but did not by any means eliminate the danger.

W— received no pay for this time he was ill and was later refused a job at anything other than the lead pots.

*Case No. 23.—James C—:*

A young Irishman, 33 years of age, was out with his eight-months-old daughter and his four-year-old son when the inspector came upon him. He still showed marked effects of lead poisoning, and his fairly big frame looked gaunt and thin, and he was slightly stooped. His wife, an enthusiastic, bright and jolly person, joined us and helped out with accurate dates and figures.

C— was formerly employed as an inspector of meat in one of the big packing houses, but left that job after a severe attack of blood poisoning, caused by a scratch from a rotten ham bone. He then found employment, in the spring of 1909, in the magneto factory. He was employed as a hardener; the process used was a gas one, and although there was one small lead pot, it was only used occasionally, and then only for warming the metal. In December, however, the process was changed, and five lead pots were installed, in which the magnetos were heated to a white heat and then dashed into a barrel of water. The place selected was a low half-basement shed, with few windows and no ventilators. C—'s job was to put the magnetos in the lead and then remove them. The pots at that time were unhooded. He worked on this job from December 13th to April 15th. During this time he lost weight steadily; pains in the abdomen were constant, his face took on a yellowish hue, and his gums exhibited a marked blue line. Finally he was forced to go to bed, and his physician at once pronounced it lead poisoning. He was out of work for 3½ weeks, and his doctor's bills, medicines and special expenses amounted to about \$75. He received no compensation, nor were his bills or lost wages paid. His wages at this job had been \$15 per week and he had worked 54 hours per week. During that time he had also put in considerable overtime. After his illness he went back to the magneto company, where he was given a job at the same wages he had been earning before that time.

*Case No. 24 — William C—:*

A "furnace man," making red and yellow oxides of lead, is William C—. Since the beginning of last March he has had three separate attacks of lead poisoning.

The first of these attacks was in March, and lasted one week; the second began in April, and lasted five weeks; and the third in November, cost him two weeks — eight weeks in all lost in less than a year, due to an almost wholly, if not quite, preventible industrial disease. The symptoms each time were about the same. They included cramps in the abdomen, weight on chest, vomiting and partial paralysis of the wrist.



C— was born in Lithuania in 1877. His parents were Lithuanian Catholics. He worked there for some years as a farm hand and later as a railroad section laborer, and in February, 1904, migrated to America. For four years and a month from that date he worked for the A— S— and C— Co. on J— street, Brooklyn, lugging sugar and coffee on the company's docks. He received \$10 for from 60 to 72 hours work per week, the day varying from 10 to 12 hours, with 1 hour for lunch. From 5 to 10 weeks were lost yearly through slack time, and once he was out 11 weeks with a foot crushed by dropping a heavy plank on it—but had no other disability resulting from his work.

Between March, 1908, and October, 1910, C— was a dock worker for the W— S— Co. in Brooklyn, and sometimes in New York. Here his time was much more irregular, so that, counting up the days and half days, he lost about 20 weeks per year. While the day's work was supposed to be set at 10 hours, sometimes he could put in no more than that in a whole week—other weeks, again, he put in 60. His pay thus ran from \$3 to \$18 per week. No illness was reported for this period.

Finally, being laid off on the docks, he was taken on at the red lead or lead oxide works, where he now is. His work is to place the lead pigs, weighing from 105 to 150 pounds, in the furnace and rake them over at regular intervals until the proper degree of oxidation has been reached, when he removes the red and yellow powder. (See photos 29, 30 and 31.) This is a very dusty part of the work, and it did not take the worker long to get "leaded" at it. There are two shifts on this work, which alternate weekly. On the day shift the men do 10 hours daily, or 58 in the week. The night shift is 13 hours, making 78 in the week. On the day shift the pay comes out to \$12 a week; at night to \$19.60. One hour is given, C— says, for dinner. He has lost no time through slack work, but the above-mentioned eight weeks through illness.

C— is single. Instructions were given him, he says, when he went into the lead works. He was told to wash carefully, keep out of the dust all he could, and keep his finger nails clean. There were no warnings posted in the plant, according to him. In the morning he usually had no appetite and made a meagre breakfast on a cup or two of coffee. He doesn't smoke or chew, but takes

three or four glasses of beer every day; rarely a glass of whiskey. He is in the habit of eating in the work-room, first washing his hands in cold water. He changes all his outer clothing in the shop. He recommends hot and cold water in the factory, wash-rooms, lockers, and a doctor; beyond these he has no suggestions for protective measures.

*Case No. 25.—Michael K—:*

K— has been in this country five years and practically all this time has been employed as a furnace man at the lead oxide works. In that time he has had no less than ten attacks of lead poisoning, the first one in 1908, two years after taking up the work, and the last only a week or two ago, in December, 1911. This last attack kept him seven days from work; the others kept him out from two days to two weeks.

K— is a Lithuanian Catholic, born in 1885. From 1899 until 1906 he worked on his father's land, tending the crops and taking care of the livestock. In November of 1906 he thought to better his fortunes and set sail for America.

The first job he took was that of furnace man, raking hot pigs of lead over and over until they were properly oxidized for lead litharge and red lead. He works one week by night and one week by day, doing thirteen hours daily on the former, ten on the latter. On night work his pay is \$17.16, on the day shift only \$11.60. One hour is allowed for lunch.

For the first year and a half the work was uninterrupted. Then came a lull, and, to fill in, K— took work as a dock laborer with the A— S— and C— Co., which has a large plant on the Brooklyn water front at Jay street. His time here was very irregular, varying from 8 to 16 hours per day; and his pay only averaged about \$10 per week. Work at the lead factory picking up again, he left the docks before the month was over, returned to his furnaces in July, 1907, and has been there ever since — except for his ten attacks of plumbism.

His symptoms he describes as pains and weight on the stomach, headaches and cramps in the knees. Four years ago he weighed 185, now 165. He is a tall, fine-looking young fellow, however,

and does not show any visible signs of illness. He married in 1910 and has one child, a boy, who is plump but pallid. His wife chides him for staying in the lead works, saying "he's sick all the time," but he replies that is all he knows how to do, and must stick at it if they are not all to suffer.

He says the foreman at the works warned him of the dangers and gave him careful instructions for self-protection. He also says that there were signs tacked up in the factory, but none in Lithuanian, which is the only language he can read. His breakfast usually consists of coffee and bread. He smokes about four cigarettes daily and drinks from two to five glasses of beer. He frequently eats in the work-room, but sometimes comes home to dinner. He washes his hands in cold water before meals. All his outer clothes, even to the shoes, are changed before he starts work in the factory; he wears a mustache, but no beard.

Wash-rooms, hot and cold water, lockers, and a doctor are the extent of the precautions in the shops as he described them.

*Case No. 26.—Walter C—:*

Another European farm laborer, attracted to America by dreams of wealth, only to take up work in a lead factory and come near finishing his career through plumbism, is Walter C—.

C— was found living with friends on the top floor of a house only two blocks away from the work which nearly finished him.

He was born of Catholic parents in Poland in 1886, worked a few years there as a farm hand, and in 1910 emigrated to America. At once, in April of that year, he became an employee of the lead company and worked there until June, 1910, as a furnaceman's helper. After the lead pigs had been oxidized to the chrome yellow stage by the furnaceman, the latter would draw or rake out of the furnace the oxidized mass (see photo No. 31) and C— would assist in this process and then wheel the stuff away on a wheelbarrow to the next process, that of crushing and grinding. His pay at this dangerous and dusty job was \$9 per week of 59 hours, with only one-half hour for dinner. From April to June this work was steady, but on the 24th of the latter month C— fell violently ill and was taken to the Brooklyn General Hospital.

The diagnosis was promptly one of chronic lead poisoning. The worker's symptoms were violent cramps, weight on the chest, incipient wrist drop, partial paralysis of the ankles and legs, loss of appetite, with blue line on the gums prominent. For a week and a half he remained in the hospital under treatment, and on July 4th, 1910, was discharged, "condition improved." The extent of the improvement was that he was able to go home, where for six months longer, or until January, 1911, he lay in bed or about the house, too debilitated to work a stroke. In this period his weight fell from 150 to 120 pounds. He has now recovered flesh to about 140 pounds.

To this recovery the nature of his present work has largely contributed. Like many other men poisoned in this same plant, upon recovery he became a longshoreman on the Brooklyn docks. This strenuous out-door occupation helps to eliminate the lead by toning up the condition of the body. His work is very unsteady, one day he may work 12 hours, the next none at all. His hours per week run from 40 down to 8, and his pay slides in proportion from \$10 to \$2. One slight compensation is that he now has a full hour for dinner.

C— is unmarried. He says no instructions were given him concerning the dangers of the work in the lead works nor were any notices to a similar effect displayed. Coffee and bread made his customary breakfast. He used no tobacco whatsoever and drinks only one glass of beer daily, with a meal. He used to eat in the work-room, first washing in cold water. His clothes he changed at home; he wears a mustache, but no beard. Cold water and the doctor are the only precautions he knows of the factory taking for its men; he thinks respirators are sadly needed.

*Case No. 27.—James P—:*

Native American, born about 1865, has been a glass cutter all his working life, about 28 years. Had his attack of lead poisoning while working for a cut glass concern in Brooklyn, a firm now out of business. There his job consisted of cleaning the cut glass with a putty and with a finely powdered mixture of lead and zinc, probably lead litharge and zinc carbonate or zinc oxide. This

process is exceedingly dangerous and has since been replaced by an acid bath. In all he worked for this concern about 22 years. Twenty years ago he had his first attack of lead poisoning, and was out of work three weeks. Two years later he had another attack, and was again out of work for three weeks. Three years later he had the third attack, and the last one. This was eight years ago. He was sick at this time eight weeks. On this last occasion, however, he was operated on for appendicitis. Whether or not he actually had appendicitis is something that cannot be definitely decided, although the doctor who operated states that such was the case. Before the last attack he decreased in weight from 150 to 95 pounds. He is still employed in the same line of industry and is engaged in the ordinary glass cutting. In this establishment there is little putty used and the old polishing process is not used at all. He is now in good health and has experienced no permanent effects.

*Case No. 28.—Frank S—:*

Was born in Naples in 1871, of Italian parents, and came to this country at the age of twenty-four. He has worked at several different trades but never at any where lead was used until he entered a dry color factory in Brooklyn. There he remained for a year, leaving to work on the docks in Jersey City for two years. He then returned to the same color factory, where he contracted lead poisoning after working there three months. The exact process he performed he described as grinding chunks of red color, somewhat as one would grind coffee, which, of course, is the grinding of dry colors. The men, he says, were aware of the danger and held wet sponges to their faces; but they were never told of the dangers by the employer, neither were any instructions posted. They were required to work 10 hours per day, with only a half hour for luncheon, which had to be eaten in the work-room. That the same dangers were common to all may be judged by the fact that he says that as many as one man a week was attacked, while the foreman, after working there for 20 years, finally died of the disease.

The owner and manager of this factory stated to the Commission that no case of lead poisoning had occurred in this place during the last ten years.

Mr. S— is smooth shaven, of medium height and though he seems to feel no permanent ill effects from his attack of lead poisoning, however he has not returned to the factory. He smokes a pipe a great deal and drinks moderately. Very often he went to the factory with only a glass of wine for his breakfast.

*Case No. 29.—William H—:*

Is a native of Ireland — born there in 1860. He emigrated to the United States in 1874. For 35 years he has been more or less in contact with lead — usually employed as a smelter, melter or caster of lead and other metals. He has been employed for 24 years with one concern and worked with G— and C— (cases Nos. 32 and 37) at the same factory when it was located in another part of the city. Both of these men died of lead poisoning. H—, however, claims that he was not affected at that time. He continued at this work as a melter and caster of solder (mostly lead) until he lost the use of his hands, with double wrist drop. H— has been to a number of doctors, who do not seem to agree as to what is the matter with him, nor have they succeeded in improving him very much. His wrists have been in this condition for about eight years, and have improved slightly, although he is greatly handicapped. The factory people have given him a job as night watchman, and that job he has held for eight years.

He smokes a pipe, drinks considerably, and wears a rather heavy moustache.

*Case No. 30.—Joe B—:*

Came to the United States in 1907. He is a Lithuanian, about 28 years of age. Before coming he was a farmer. He first found employment in a machine shop in Newark, and later in a dye factory at Worcester, Mass., where he received from \$9 to \$14 per week, and worked 10 hours per day. He came to work for a dry color concern on January 21, 1911. He worked steadily until the middle of August, when he had an attack of lead poisoning. The attack was not very severe, but he was out of work on that account for three weeks. Since that time he has worked at the same place and the same job with the exception of slight attacks

which have kept him out of work on two occasions for two days each. Severe abdominal pains seem to be practically the only effects of lead poisoning in his case.

In spite of the statement made by the superintendent that they had had no cases of lead poisoning in the last 40 years, B— has had lead poisoning—perhaps without the knowledge of the concern. His work has been of a rather dangerous character. He has been employed in the color-mixing and grinding room. His work consists of shoveling the various paint pigments into the grinding machine and then mixing and stirring the ground pigments. (See photos 40 and 41.) The room in which he works is very poorly ventilated, having only small windows, and not many of those, and the system of ventilation is not a localized one and therefore does not convey dust from the immediate vicinity of the workmen. Very often workers are required to clean out the bins in which the colors have been put. This is an extremely dusty process, as it necessarily means stooping over the low bins, and clouds of dust rise in their faces as they brush out the contents.

For this work B— receives \$1.85 per day, working 10 hours. As far as the writer could learn he had been given no instructions whatever as to proper precautions to take. He was not provided with any respirator or other protection against dust and lead. Half an hour is allowed for lunch, which in many cases is eaten in the work-room. B— uses tobacco a little, drinks some beer and usually has a glass of whiskey each morning. When the inspector called, on Sunday, he was eating his lunch. His hands were covered with the paint in which the inspector had seen him working a few days before. He works about two Sundays in each month. His brother, who lives in the same house with him, is a worker at the same factory and is also affected by lead poisoning and is out of work often.

B— related that very often the room in which he works becomes so dusty, as he expressed it, "You can't see a man an inch away." He does not talk English very well, although he grasped most of the questions put him. He is intelligent and knows that others of the men have had similar attacks and mentioned a man who was at the moment dying. He did not know the name and address.

*Case No. 31.— Mitchell C—:*

A solder caster, now employed in a smelting and refining place, is subject to attacks of lead colic, accompanied by pains in his arms. He left his native England and came to New York in 1886. His parents were natives of Ireland. He was married in 1900.

In 1891 C— commenced working with the Blank Smelting and Refining Co., where he remained for ten years. His work was tending the furnace, shoveling dross, tending lead kettles and casting solder. He considers tending the furnace the work which affords the greatest chance for becoming poisoned. Yet he often finds, when tending the lead kettle and casting solder, the draft forces the particles of lead all through the air he is breathing. He had attacks of lead colic while in the employ of this company. He went from the Blank Smelting Co. to J— B—, smelters and refiners, for about four months — then to T— & Co., smelters and refiners. After one year at this place he went to the W— Smelting Co., then back to J— B— for one year — returned to the W— Works for about one year — to J— B— for six months, and then to his present position with W— B—. In nearly all of these places he has done the three kinds of work previously mentioned, though solder-casting is his usual work.

He has suffered from attacks of lead colic while under the employ of each company with the exception of T— & Co., where he thinks the factory is in good condition. At W— B—, the drafts are bad, on account of doors being open for shippers. There are hoods over the lead kettles, but many times these avail nothing, since the back draft brings the oxidized particles of lead back into his face. He would have some means of ventilating the work-room and of hindering the improper drafts. He thinks, also, that lunch-rooms are necessary for all such shops. No instructions concerning dangers of work are given, or posted. There are clothes-rooms, which are used. He always removes his work clothes before leaving the shop. He is careful about washing, using hot water and soap. He has food brought in which he cooks and eats there in the work-room. He usually wears a mustache, but had it removed at one time, to see if attacks of lead



colic would be less frequent. He thinks there was no difference. He eats no breakfast before leaving home, — but drinks a cup of coffee. He has no appetite for food at that time. He uses about ten cigars in a day and a half, but practically no alcoholic drink. He has never lost time from being unemployed. From illness he loses two or three days each time. At W— B— he receives \$18 per week of 57 hours. He works  $9\frac{3}{4}$  hours each day except Saturday, which is an eight-hour day. He is allowed three-fourths of an hour for lunch. At all other places his usual wage has been \$14 per week of 58 hours — a ten-hour day with one-half hour for lunch, and eight hours of work on Saturday.

*Case No. 32.—Patrick C—:*

A brother of Mitchell and John C—, Patrick is also a solder-caster. He came to New York city from England in 1886 with the brother Mitchell.

He was married in 1908. There are no children. His and his wife's ages are respectively thirty-four, and twenty-one years. He is now working beside his brother Mitchell as solder caster for W— B—, and has been there for the last six years. Before he came to W— B— he was employed by J— N— J— for six months; W— S— and R— Co. for two years; M— S— and R— Co. for a short time; T— and Co. for two years; J— B— for two years; X— Smelting and Refining Company for about two years; and for D— B— eight years. While with D— B— he lost one week from an attack of lead colic, with J— B— he lost two weeks from an attack, and since he has been with W— B— he has lost a few days each time during several different attacks. Pains through his arms and elbows accompany the lead colic. He had nothing to add to what his brothers had said in regard to hours or wages, conditions in the shop or chances for improvements. He is careful about his clothing and washing his hands. He keeps tobacco in his mouth while he is working — he thinks it better for him to do this. He smokes cigarettes most of the time when he is away from his work, and uses about three pints of beer a day. He seems to realize the dangers of poison from the lead yet he wears no respirator and he says his expectoration is often as black as ink.

*Case No. 33.—John C—:*

Solder caster, brother of Mitchell C—, left England for New York city two years earlier than his brother, in 1884. He has followed his trade continuously, employed at different times by all the firms which have employed his brother.

He is a single man forty-eight years of age. About the year 1887 he commenced working for D— B—, where he remained for fourteen years.

In 1902 he commenced with the W— S— and R— Company where he remained seven years. The rest of the time between 1901 and 1911 he had been employed for more or less short periods by the following companies: J— B—, D— B—, W— S— Co., W— B—, and T— & Co. In June, 1911, he was employed by W— S— and R— Co., but was obliged to give up just before Labor Day because his wrists were in such a bad condition. (The superintendent of this factory says he hasn't heard of a case for six or seven years.) He felt the effect of lead when he was with W— B— in 1910, also when with T— & Co., 1910 and 1911. He returned to the W—Works several times and tried to work, but found it impossible. Since September, 1911, he has been totally incapacitated for work with his hand, and has been unable to secure work.

For improving conditions in these shops, he seems to be able to offer no suggestions in addition to those offered by his brother. He said he had always been careful, and used every precaution of which he had knowledge. However he is in the habit of using two or three packages of tobacco a week "in the form of a pipe" and occasionally drinks two or three glasses of beer a day. At present he wears a mustache. His wage and hours were practically the same as those of his brother—the only modification of hours being a seven-hour day on Saturday with D— B—. His wage was \$2.50 a day.

*Case No. 34.—Patrick C—:*

Died so many years ago that it may seem like ancient history to narrate his case.

He came to the United States about 1876, and married shortly after, and was the father of three children. He found employ-

ment almost immediately with T—, smelters and refiners of metal. Here he worked for thirteen years over the pots where lead was melted and later poured into molds. During this time he was subject to constant attacks of lead poisoning and was home sick about half the time. Especially during the last two years of this time he was almost incapacitated,—he had a severe case of wrist drop and had serious swellings in the legs. After it became impossible for him to work longer at the melting pots, he was given a job as watchman at the factory, which he held until his death, three years later.

The factory where he worked has been torn down and the firm has removed to Jersey.

C— at his death left a widow and three children. Mrs. C— went out to work to support the little family. The men of the T— shop made up a purse of \$100 which came in very handily. The firm, however, did nothing but express sympathy.

C— was not a hard drinker — smoked some, but did not chew. He earned good wages and was careful in his habits.

*Case No. 35.— Timothy G—:*

Born in 1865, a native of Ireland, came to the United States in 1886. He had been twice married. Since the death of his second wife he lived until the time of his death with Mrs. B—, who gave the necessary information; his aunt, Mrs. C—, added to it and it was finally corroborated by William H—, who worked with him.

He worked as a smelter for 17 years prior to his death, at several places which have now gone out of business and of which Mrs. B— could give no definite information. He worked for many years at T—'s, where C— and H— also worked. Here he showed definite signs of lead poisoning and was ill a considerable portion of the time. Later he was employed with W—. His last job was with J—. Here he worked five years and became totally incapacitated. From Mrs. B—'s description of him it was clear that he had had a very bad case of double wrist drop and that his arms and legs had become partially paralyzed. After leaving J— he tried to run a little coal and ice shop; his condition became worse and he was taken to the Metropolitan Hospi-

tal, where he died. An autopsy was performed at Bellevue Hospital.

For a considerable time prior to his leaving the employ of J—, he had been in very poor health and had had attacks of lead colic, which kept him from working for considerable periods. He was also at St. Vincent's Hospital and two or three convalescent homes.

G— is reported to have been a considerable drinker, but not to excess. He wore a mustache. He was very cleanly and his aunt narrated with some wonder how, during the hot weather, he took a bath in a tub every evening. He smoked, but did not chew. He earned very good wages, when his health permitted, as much as \$21.00 per week.

His first attack came suddenly and another victim of industrial poison scarcely beyond his prime passed over the line.

*Case No. 36.— James McP—:*

Is employed with the N— Company. He is an interesting man, intelligent, and his employer gave him a record of being a steady, reliable and sober worker. He had his first attack of lead colic in February, 1911, when he was ill two days. He has had several minor attacks since then, and is now out of work about one day every two weeks.

McP— had worked at his present occupation, smelting and casting, for 21 years, and last February was the first time he noted ill effects therefrom. In early life he did odd jobs and chores around the farm of the man he lived with. His first really continuous work was when, in 1890, he got employment with the C— Lead Company, as a "mixer" in the type and solder metal room. Here his duties were to measure out the ingredients for the various sorts of composites required, attend to the melting of them, skim, when necessary, stir, and finally pour them out into pigs.

Four different sorts of metal are thus prepared, each with a great, and almost overwhelming proportion of lead. That containing the least of this dangerous metal is the ordinary plumbers' "half-and-half" solder, which is composed of 50 per cent tin and 50 per cent lead, by weight. As tin is much more expensive than

lead, there is a constant temptation to substitute, and other solders, also called "half-and-half," are made for the coarser and cheaper work, in which the tin sinks as low as 38 per cent, and the remaining 62 per cent is all lead. The name "half-and-half" thus becomes a meaningless "trade custom," and it becomes necessary to specify, when buying solder, just how much tin you insist upon having. Various grades are made and guaranteed by the companies. A blend of 43 1-3 per cent tin to 56 2-3 per cent lead is the common standard for roofing.

Stereotyping metal comes next in lead content, having only 4 per cent tin, 14 per cent antimony and 82 per cent lead. Slightly softer than this through its additional 1 per cent of lead, is the metal used in the melting pots of linotype machines: tin 4 per cent, antimony 13 per cent, lead 83 per cent. Nearest to pure lead is electrotyping metal, which is wanted very soft, and is composed of tin 2 per cent, antimony 4 per cent, lead 94 per cent.

In the smelting of these ingredients together, the stirring, the skimming and pouring, there is bound to be some oxidation, and that is largely the source of danger. McP— worked with the C— people fifteen years (June, 1890 to February, 1905), during which time he lost regularly from 4 to 6 weeks per year through unemployment. He was never ill in this plant. There was running water, which the men would heat on a stove in cold weather for washing purposes, the hours were 10 a day with 9 on Saturday, making a 59-hour week, only half an hour was given for meals, and the pay received by this man was but \$13.50 per week.

Mainly to better himself in this respect, he took up work in February, 1905, with the N—Company, then a new firm, with whom he has stayed ever since. His work was practically the same as in the other place, the only difference being that he now makes more solder and less of the type metals. Here his pay is \$15 per week, work is much steadier, only 3 or 4 days per year being lost as a rule; the long hours and the short one-half-hour lunch time remain unchanged.

When seized last winter with the colic, McP— suffered from cramps, constipation, headache, loss of appetite, loss of weight, and a dull and heavy pain in the abdomen. He called in a doctor

who treated him, but only admitted that the trouble was lead poisoning upon a direct question. After two days out of the shop McP—went back to work. Ever since the cramps in the stomach have been bothering him at intervals of two or three weeks, meaning the loss of a day's time at each recurrence.

As a workman he is strong, vigorous and active-minded. He was born in Tipperary, Ireland, in 1872, but was brought to this country at the age of two. In 1897 he married a splendid young countrywoman of his, who was born in 1878. Five children have been born to them. Four are now alive, all bright and intelligent, and ranging from 11 to 1 year in age. The third child, a boy, died in 1905, at 10 months. He had thrived as long as his mother had been able to nurse him. When he went on the bottle he began to fail, and the summer after his birth succumbed to summer complaint. There is no history of miscarriage or premature birth.

In the C— works where McP— worked first, verbal instructions were given the men as to how to avoid the dangers of the trade. They were warned to keep out of the dust all they could, to keep the floor wet down, and to sweep as often as they could. No printed notices were put up. He regularly eats a solid breakfast of meat or eggs, and potatoes. He chews tobacco nearly constantly, believing that it helps clear the throat and stomach of lead dust, and rarely smokes a pipe. As to alcohol, he is almost a total abstainer, taking a glass or two of beer only at very great intervals on some special occasion. In the first place he worked he used to eat lunch right in the shop, or sitting outside in warm weather. Now he lives so near to his work that he is able to come home every day. He always washes before meals, in either hot or cold weather. He wears a moustache, but never had a beard. A novel feature of his case is that in some of the departments of the factory the men wear "muzzles," or respirators with cheese cloth. Most of the men, himself included, change clothing completely when they go to work, and put on overalls.

*Case No. 37.—Tonio M—:*

In a rear ~~room~~ dark as pitch, in a basement 8 feet below the street, Tonio M— was found, caster for a white lead company.

He is a splendid looking man, with a kindly face and a martial bearing. Due, perhaps, to the system he has worked out of alternate lead and non-lead employments, he shows superficially no traces of the chronic plumbism with which he is now afflicted.

M— is a Pole by birth, and a Catholic. He was born in 1870, and in youth learned carpentry in his native land. In 1906 he thought he saw a wider field across the water and came to America, going at once to some place "in Connecticut," where from June until November he plied his chosen calling for \$6 a week and keep, 60 hours per week.

Building operations then being slack, M— drifted to New York, where, with a few breaks, he has been ever since. His first work here was as a porter on the A— S— Company's docks in Brooklyn. His pay here was \$9.30 a week, 10 hours daily, with an hour for dinner.

After a little more than a month at this M— got work in December, 1906, at a white lead company. He was made a "caster," that is, he operates the kettle in which lead pigs are placed and melted and from which they are poured out in the form of "buckles" for the corroding rooms. The danger here is from handling the pigs, and from breathing fine particles of oxide when the molten lead is skimmed or stirred. His pay was then, and is now, on this job, \$12 weekly, his hours 10 per day, 59 per week, and his dinner time one-half hour daily. In these first four years in the lead shop he lost no time through slack work, but about a week in days here and there during which he was incapacitated through lead colic. He cannot remember the exact dates of these attacks, but there were more than one per year.

Finally, taking warning from his condition, M— decided to "cut" the lead works and the city for a time, and went to North H—, Conn., where again he worked at building and carpentering, from June to October, 1910. His pay was only \$10 for 60 hours a week, but he was in the open air, and by fall he had recovered, to his own satisfaction, from the lead.

So back to his casting furnace in the latter month he came. His work, hours and pay remained the same as before, but not so the length of his employment. In March, 1911, after only six months over the furnace, he was laid up with an attack of paralysis of the fingers, pains in the stomach, and complete bodily

weakness. For six weeks he lay at home in this condition, hardly stirring from bed, dosing himself with a prescription written by the company physician. When the six weeks had passed and he again felt able to work, he returned to North Haven.

This was in May, 1911. From then until the middle of July he worked in a brickyard, shaping bricks by machine, and getting \$12 for a 60-hour week, with one hour for dinner. Then slack work drove him back to the lead work.

Here he has worked ever since, losing no days because of illness, but never feeling quite well. As soon as he begins to feel "colicky" he takes a dose of salts and a sip of the physician's medicine and so managed to worry along. The symptoms of paralysis are not at the present evident, but his demonstration of how he couldn't hold a spoon when he had the attack was most pitiful.

M— married in 1893, his wife was born in 1874. The couple have had five children, of whom four were boys, but all five were born in Poland before their father came here, and have never come to America. The father wears no beard, but a moustache, eats meat, bread and coffee regularly for breakfast, takes 10 cigarettes daily, but rarely touches either beer or whiskey. He used to eat dinner in the workroom, washing in cold water before eating. He says the company once had respirators for the men; it also furnishes cold water and a doctor.

Stomach trouble seems to be a permanent effect of lead in this case.

*Case No. 38.— Abraham F—:*

Russian Jew, born at Warsaw, Russia, came to this country in 1899. He is now 33 years of age and is much above the average in intelligence.

He learned his trade, as a diamond worker, in the famous diamond market, Amsterdam. Ever since coming to the United States he has worked at his trade. At the first place where he was employed he remained eight years, and it was while working there that he began to feel the first symptoms of what his doctor later diagnosed as lead poisoning.

His particular job has been diamond polishing. The diamond is placed in a chunk of lead, which is held by the worker on a



short stick. This chunk of lead is shaped very much like a small pear, and the diamond is at the apex. The diamond is held against a rapidly revolving disc, which polishes off the surfaces of the stone. The man's hands become grimy from the use of the lead and a certain amount of lead dust is ground off.

F— began to feel the first symptoms of lead in 1900. The doctors to whom he went did not seem to be able to diagnose his case and gave him sleeping potions. He did not improve. He was troubled with sleepiness, constipation, impaired vision, weakness and a slight palsy in the arms, hands, legs and feet. He has had no attack of lead colic and has not lost weight, apparently, and except for a slight pallor of countenance he did not look ill at all.

He has just given up his job, at the advice of his physician, and is about to go abroad to visit his parents. He intends to remain away from work about four months, to enable him to get the lead out of his system. He also expects to consult foreign specialists.

He was never given any instructions regarding the dangers of the work. He is accustomed to smoking usually about three cigars daily, even while working. He drinks, perhaps, a glass of whisky once in three months. He has been accustomed to eating in the workroom, usually without washing, no hot water being provided. He stated that the men usually left their finger nails very short in order to prevent them from getting very black. He believed that the workers should be told concerning the dangers of lead poisoning and they would then take the necessary precautions.

*Case No. 39.— Franklin K—:*

A young printer, only 22 years old, a native and lifelong resident of Brooklyn, died suddenly of lead poisoning on October 14, 1910. He had never been ill before in his life. He was brought home suffering terribly on a Monday afternoon; Friday, he died.

K—'s industrial career was varied, changing from printing to shoemaking and back again. Some time in 1895 he first began work as an errand boy and job-press "kicker" in a little print-

ing shop in Brooklyn. His presswork was limited to printing by foot power small jobs, such as envelopes and visiting cards. His wages were not high — \$2.50 to \$3 per week — he worked eight hours a day, 48 a week, and got a whole hour for lunch.

In that same year, 1895, he tried shoemaking, becoming a "stitcher," or one who sews soles and uppers together, in a large shoe plant. Here, by doing piecework, he was able to grind out \$10 or \$12 per week, working 54 hours in winter and 49 in summer, with an hour for lunch. Neither on this nor the previous job did he lose any time through illness or unemployment; but in 1905 he was permanently laid off, and it was a year and a quarter before he found work again.

When he did, it was to return to the types, where he had been formerly. He became a hand compositor and make-up man, worked steadily for the nine years from 1901 to 1910, lost no time through slack or illness, and earned on the average \$10 to \$12 weekly for 48 hours. One hour was again given him for lunch.

What happened at this job his family do not know, but he left or lost his place, and again, for a week, was unemployed. Then he found work at the same occupation with a large printing firm in New York city. He went there in August, worked steadily until October 10, and then suddenly was taken violently ill.

He was rushed home to Brooklyn and a doctor called. So terrible were the young man's agony and contortions that the practitioner at first thought he had taken poison. His stomach was pumped, and the physician decided it was lead. For three days, at home, the young printer suffered, crying aloud in his pain, his body doubled up, his appetite gone, and racked with spasmodic vomiting. Two days more he lingered at the German Hospital in New York and on the fifth day after his seizure was taken home dead.

K—'s pictures show him to have been a stalwart, wide-awake young chap. He never married. It is not known whether warnings or notices of the dangers from lead were ever presented to him. His customary breakfast was coffee, with a roll or a piece of cake. Once in a while he smoked a cigar, but consumed about four cigarettes daily. Once in a great while he took a glass or two of beer.

He always washed in cold water before eating and never took lunch in the shop. He was in the habit of changing his trousers before getting to work, and was clean shaven. His family physician diagnosed his case as lead poisoning.

*Case No. 40.—Alexander G—:*

On October 10, 1910, Alexander G— died of chronic lead poisoning contracted while employed as a printer.

G— was an old man — 64 when he died — but rugged American stock of Scotch extraction. "He had an iron constitution and a nerve that never let go," said his wife. He was tall and at his prime weighed 169 pounds. At death, after ten years' suffering, he weighed 89 pounds.

He was born in Brooklyn in 1846, the family having come over from Scotland in the previous century. Early in life he learned the printer's trade. He was an expert compositor, job hand, make-up man and "stone man." He also was a press expert, and was the mechanical mainstay of the plants in which he worked. When anything went wrong with machines or presses, the word was always "Send for Sandy."

When he first came into his wife's life, in the early '60's, he was working for a printing concern in New York. He then received \$18 for a 60-hour week, with one hour allowed for dinner. In 1868 they were married, and two years later he took work with the Blank and Blank Company, New York. His hours were still 60 a week with one off for dinner each day. His wages at first were \$18 a week, the same as at his previous place, but later were raised to \$21, where they remained. In pre-election rush times, by working several days and nights steadily and drawing the double pay required by the Typographical Union for overtime, he was occasionally able to make \$40 or \$50 for the week. The inhuman strain he thus put himself under, however, may have contributed in no slight degree to his final "leading" and death.

He remained with the Blank and Blank firm from January, 1870, until the summer of 1906. In 1904 he lost four weeks because of rheumatism, but apart from that work was steady

and his lead poisoning had not yet grown severe enough to keep him at home. About 1888, however, he began to complain of terrible cramps in the stomach. He contracted a deep cough and expectorated heavily. These two circumstances led him to believe he had catarrh of the stomach, a theory he held to his dying day, always indignantly scouting the physicians' diagnosis of plumbism. He consumed vast quantities of sal hepatica, stomach tablets, seidlitz powders and the like, but all the time his cramps were getting worse, his appetite failing, and his powerful strength waning. He lost his color and became almost as white as a sheet—pernicious anemia had set in. Vomiting, inability to retain any solid food, came as the culminating blow. In 1889 he had moved his family to H—, N. J., and commuted to work, but even the change of air did not help him, and in the summer of 1906, as stated above he was finally forced to quit work. For three or four weeks he tried to work as a gateman at a grade crossing, for a railroad at the wage of \$7 a week, for 12 hours a day, Sundays included. But although the gates were "automatic," the work was too much for him in his weakened condition, and before the end of the month he left.

The following four years he spent at home, moving back to Brooklyn in 1907 to be near his boyhood haunts. A \$16 a week benefit from the Union and his children's earnings supported the home. But his condition became more and more alarming, and in the middle of August, 1910, he was removed to the Presbyterian hospital for treatment. He was kept there for seven weeks under the closest supervision, being frequently seized with convulsions, and most of the time delirious with pain. On October 1 he was brought home as hopeless, and on the 10th he died.

G— and his wife had twelve children, six of whom are to-day alive and grown up. The oldest, a boy, born in 1868, died of concussion of the brain, due to a fall, at the age of ten months. The fourth, a girl, died at two months, from pneumonia, in 1873. The ninth, a girl, was accidentally killed the day of her birth in 1887 by her mother's falling with her. The eleventh, a girl, born in 1890, succumbed at ten months to bronchitis.

The other two who died require special consideration. They are the tenth and twelfth in order, both boys, one born in 1888 and the other in 1891, the little girl who died of bronchitis coming between them. 1888 is two years before, and 1891 is one year after, the date somewhat roughly set by Mrs. G— as the beginning of her husband's lead symptoms. He may well have been suffering before 1888; her memory on that point is not clear. Both these infants were born dead, the first at full term, the second at seven months. This, especially when coupled with the fact that the intervening child did not have stamina enough to withstand at ten months an attack of bronchitis, apparently betrays a progressive impregnation of the infants corresponding to the growing intensity of their father's leading. This seven months' miscarriage was the wife's last attempt to have children.

Mrs. G— does not know whether her husband was ever warned of the dangers of lead in his trade or not. She thinks he may have absorbed the poison through holding type in his mouth, by handling the type, and by inhaling the dust. He always ate a light breakfast of coffee and only a part of one roll, ate the noon meal in the shop, and always washed in hot and cold water. He wore a mustache but no beard. He wore an apron while at work, but was accustomed to no other change of clothing on ordinary work days. He is described as an almost constant chewer of tobacco, believing it was good for him, and a frequent smoker. His wife, who was a strict teetotaler, told with sorrow that he was a rather heavy drinker, Scotch whiskey being his favorite.

Both the staff of the Presbyterian hospital and the coroner's physician, of the Coroner's office, Brooklyn, diagnosed G—'s ailment as chronic lead poisoning, and there can be no doubt that this is a case of a powerful, able man succumbing to that industrial poison.

*Case No. 41.— Adolph H—:*

H—, a Catholic German, was born in Germany in 1853. In 1888 with his wife and children he came to American and established his home in Brooklyn where he has lived ever since. He

now has eight children, four married and four at home. H— is a carpenter by trade, although for nine years he has worked intermittently in a blacksmith's shop. In 1906 he began working in the same car repair shops in Brooklyn, where up to six weeks ago he has worked, with the exception of a couple of months each summer when he worked in a blacksmith shop. He is at present employed in a blacksmith shop in Brooklyn, earning \$17 a week and working nine hours a day.

H— evidently contracted lead poisoning while working on the freshly painted cars in these repair shops. The conditions under which he worked are no doubt largely responsible for his attacks, two in number. The hours in these shops are from seven to five-thirty with half an hour for luncheon. H— had to leave home at 5.30 every morning and consequently often ate a scanty breakfast. The luncheon hour was so short that he never had time to wash before eating. He always ate at a nearby saloon and it was all he could do to get there and back in half an hour. Like most Germans, H— had his beer, but is not a heavy drinker. His attacks of lead poisoning were due without a doubt to the long hours, short time given to luncheon and lack of washing facilities. He has left the shops for good as he is now earning \$2 a week more than he earned there, and is working under more favorable conditions.

H—'s children are normal and healthy. Their mother says that they have always been well, with the exception of one daughter who has recently undergone an operation for tumor. The H—'s last two children are dead — one from diphtheria and the other from measles. H— seems to have escaped any permanent effects from his attacks of lead poisoning, but Mrs. H— says that nothing could induce him to return to the car shops.

*Case No. 42—Herman S—:*

His regular occupation is that of a plumber. He is now suffering from chronic plumbism. S—, who was seen at his home, is very weak and ignorant as to the nature of his trouble. He claimed to be suffering from constipation, and daily gastric disturbances. For a year and a half or two years back he has

had severe attacks of cramps,—a week or two apart, lasting for about an hour. He has had no cramps since returning from the hospital, October 31. Has good appetite, but is afraid to eat heartily on account of the gastric disturbances. Samuels has been a plumber and tinsmith for 17 years. He has done job work, but has worked for no particular firm. He was first incapacitated for work last March (1911). Since then he has kept a small hardware store with wife's assistance. The man claims not to have used alcohol for many years, although he smokes both pipe and cigarettes. He wears a moustache. The S— have five children, all boys but one, and all well and strong. They have lost a boy and girl by death. Mrs. S— has had no miscarriages or still born children.

*Case No. 43.—Michael R—:*

R— is a Pole, who came to this country, leaving a wife and two children in the "old country." He found employment in the brass foundry of W—, in New York city. Here he handled lead constantly and soon was affected by a disease which the doctor diagnosed as chronic lead poisoning. He went to the New York Hospital and was ill about three months. He has now returned to the old job at the foundry where brass beds are made.

*Case No. 44.—Harry B—:*

B— is a Russian Jew and has been in this country eight years. He is a tinsmith and has worked in a shop on the lower East Side for several years. B— had been well until the spring of 1909, when he had an attack of painter's colic, was sick for three months and was treated at home by a private physician.

He suffered with abdominal pains and severe pains in his head. Later he had an operation for mastoiditis.

He returned to his work after three months, and now works every day but has never been really well. He goes home to his lunch each day and is careful to wash before eating.

The family is extremely neat and clean in the home, and it is likely, therefore, that he is careful about his clothing. Mr. and Mrs. B— were married in 1907 and have no family.

*Case No. 45.—Sadie G—:*

Sadie is an intelligent, neat, clean girl, who has worked from the time she got her working papers in embroidery factories. She was a stamper and for several years before she was poisoned, earned \$10 a week. In her work she was accustomed to use a white powder (chalk or talcum was usual) which was brushed over the perforated designs and thus transferred to the cloth. The design was easily brushed off when made of chalk or of talcum, if the embroiderers were not careful. Her last employer therefore commenced using white lead powder, mixed with rosin, which cheapened the work as the powder could not be rubbed off and necessitate restamping.

None of the girls knew of the change in powder, nor of the danger in its use. The workroom was crowded and hot, the stampers' tables were farthest from the windows and the constant use of the powder caused them to breathe it continually and their hands were always covered with it.

Sadie had been a very strong, healthy girl, good appetite and color; she began to be unable to eat, had terrible colic, but continued to go to work in spite of the fact that she felt miserable. Her hands and feet swelled, she lost the use of one hand, her teeth and gums were blue. When she finally had to stop work, after being treated for months, for stomach trouble, her physician advised her to go to a hospital. There the examination revealed the fact that she had lead poisoning—which was unaccountable as no one knew that her work had involved the use of lead until some one who had been on the job also recalled hearing the manager send a messenger out with money several times to buy a white lead powder.

Sadie was sick in the hospital for six months—(losing \$10 per week). She said her employer bought off several of her witnesses, but before the case came to trial two years later several of them also became ill and consequently decided to testify for her. The employer appealed to the girl's feelings and induced her, on the day of the trial, to accept \$150. He said that he had had business reverses and consequently would be unable to pay in case she won.



Her lawyer was suing for \$10,000. At the present time the girl is 23 years old and though she has apparently good health, she is no longer strong and is very susceptible to disease.

*Case No. 46.—Thomas J—:*

Is a big Barbadoes negro, in the prime of his strength, 28 years of age. He came from the Barbadoes in May, 1911, and went to work almost immediately for the contractor on the new Fourth Avenue subway. About the middle of August his gang was laid off and he went to work in a factory making red and yellow oxide of lead. Here he worked in the sugar of lead, or lead acetate, department. His job was to shovel the crystalized lead acetate from the vats to conveyors and later to pack it into barrels. His work involved chopping out the lead in which process a considerable quantity of dust was raised, and which also involved considerable handling of the lead which he usually did with his bare hands. He worked here about a month and a half when he was taken with severe colic and weakness in arms and wrists. His doctor advised him to go to a hospital, which he did; he remained there a week and at home a week. He then returned to work, but could only stand it about three days and had another attack which kept him out of work two weeks. J— then changed his job, and, with the exception of slight pains in the abdomen, he is now feeling all right.

He says he always took especial care in washing and eating.

*Case No. 47.—Aleck S—:*

S— is a Russian Pole, 31 years of age, who came to this country with the opening of the new year, 1911. Before he had been here a year he had contracted a serious case of lead poisoning which kept him out of work for seven weeks.

He found employment with a white lead company in Brooklyn, where his job consisted of packing dry white lead in barrels. This subjected him to the dangers of dust and for this dangerous work he received \$9.60 per week. About the first of November, after about ten months' steady work, he was taken ill with severe colic and cramps, weakness in his wrists and arms. He was

put of work for seven weeks. He has returned to the factory and is again working at his old job. He has a heavy lead line and will doubtless be incapacitated in a short time.

He claims that he was never instructed as to how to care for himself or that the work was dangerous. He saw no instructions. He is evidently careful in his habits, and his landlord told how he actually refused to accept drinks even as treats. He was accustomed to eat in the work room, but had little opportunity to wash, and then only in cold water. His hands were still dirty from the day's work when the inspector saw him. The company where this man is employed has a doctor. S— claims although the doctor did treat him at first, he didn't pay any attention to him later on. He wears a respirator and doubtless this accounts for the length of time previous to the poisoning.

*Case No. 48.— Greogora T—:*

A Russian Pole. He came to this country just a year ago (January, 1911), and went to work almost at once for a white lead concern. He worked as a packer of dry white lead. Here he worked until October, or about nine months, when he was taken with a severe attack of lead poisoning. He was in Gouverneur hospital for five weeks and remained at home another week. He then returned to work, but after a week at it he was again incapacitated. Since that time he has been off and on, working not more than half the time.

He had severe colic and cramps and his arms became stiff and useless.

T— was never instructed concerning the danger of the work, although his foreman is a Russian. He is temperate, drinks very little and does not smoke. He washed in cold water ordinarily, but says he didn't have time to do it thoroughly. He is at present ill, and a heavy lead line is evident.

*Case No. 49.— Vladimir P—:*

A Russian Pole, thirty years of age came to this country in January, 1910. He found work at once in the works of a white lead company. Here he worked as a stripper of the corroding

beds, which brought him directly in contact with the dry white lead. For this work he received \$9.60 per week—a week of sixty hours, ten hours a day. Early in March of the same year he had a severe attack of lead colic. From that time until the end of the year he worked only irregularly on account of the more or less regular recurrence of the poisoning. He probably did not work more than half the time. Since January, 1911, however, he has been much better and has worked steadily.

He says he was never instructed and that he saw no signs. He reads only Russian. He is very temperate; he does not smoke and only drinks one glass of beer daily. He had severe colic and his arms became almost useless, later his knees and ankles swelled considerably.

He seems to have recovered from his illness and although still working at the same job is now healthy. He is treated by the factory physician and takes medicine regularly.

*Case No. 50.—John D—:*

A Hungarian, who works in the tempering room of a big wire works, says that he worked in the same place and at the same job for five years without having an attack of lead poisoning. About three months ago, however, he had his first attack. He was taken with severe colic and was incapacitated for a week. Since losing that week he has had slight attacks off and on which have not necessitated his giving up work for any length of time. His wife says, however, that he has no appetite now and that she cannot persuade him to eat much. He does not eat a hearty meal before going to work.

D— tends the pots of molten lead, through which the wire is drawn. He works one week on day shift and the next week on night shift. They do not give the men who work at these furnaces any time at all for lunch because the furnace cannot be left. The men eat a bite whenever they can get a chance, but do not have even half an hour in which to eat. There is no wash room, the man says, but provisions for washing are made in the workroom. When they wash, they wash there. He says all the men on that floor have had lead poisoning (doubtful). No instructions or warnings are ever given them.

D— is a young man of 22 years. His wife is three years younger, and they have been married less than a year. He is smooth-faced, dark complexioned, tall and strong looking, but listless in appearance. He uses no alcohol and very little tobacco — only once in a while a cigar at home. For all the risk he takes, with the constant danger of lead poisoning, he is paid \$12 per week.

*Case No. 51.— Charles G—:*

A young Scotchman, 31 years of age, gave up the sea some eight years ago and settled down to life as a caster in a tinfoil factory. Here his job consisted of melting up lead pigs together with tin and some other ingredients which make up tinfoil; then ran the molten composition into a mould, forming a slab of the metal about two feet square and one inch in thickness. This slab was then taken to the rollers where it was rolled thinner and thinner as desired. After working here for eight years he was taken with a sort of paralysis of the hand, the fingers,—especially of the right hand closed tightly—and he found it impossible to open them without assistance. When seen at the hospital he had been there only a week, but showed decided improvement.

At the time of the attack he was earning \$15.00 per week. He described the room where he worked as well ventilated by two large exhaust fans and as clean and well lighted. He was instructed as to the dangers of the work, and was told to wash thoroughly and to rinse out his mouth before eating. G— chews a good deal and smokes a pipe and, like most men, drinks beer and occasionally whiskey.

The place where G— worked was inspected and is doubtless the cleanest, best equipped (with the exception of hoods) of any casting room seen by the inspector. It is also evident that the man took precautions. It is evident, therefore, how very careful employers and employees must be to avoid lead poisoning.

*Case No. 52.— Alexander C—:*

Is a young Russian Pole, 26 years of age, who came to this contry in 1906. Like many young laborers he found employment

at various unskilled work until he found a position with a white lead company in the spring of 1911. Here he worked in the corroding beds, putting the blue buckles (uncorroded lead) into the jars and after the corrosion had taken place emptying the contents into a large car which carries the lead off to the separators. Here he was, of course, subjected to considerable lead dust, and after a few months began to feel distinct symptoms of lead poisoning. He had a severe attack of nausea, vomiting and cramps. This was just eight months after he commenced work. At the time of investigation he had been idle on account of lead poisoning for three weeks and his debilitated condition indicated that he would remain so for a somewhat longer period.

While at this job he worked two hours per day, had one-half hour for lunch, and earned \$12.00 per week. He was never given any instructions concerning the danger of his work and he couldn't read those posted in the factory. He ate regularly in the room where he worked, occasionally he washed before eating. He drinks moderately, one or two glasses of beer per day. He smokes cigarettes. If he gets out of this work at once and stays out, he will probably get over the effects. If, however, he goes back to work it will be merely a matter of time before he becomes thoroughly leaded and totally incapacitated.

*Case No. 53.—Raymond F—:*

A Barbadoes negro, came to this country in May, 1908. He found employment in a paris green factory where, he says, most of the men contracted a rash, or pimples, which ate deeply into the skin (ulcers). He staid there only a month and then went to work for a lead company, in the lead acetate, or sugar of lead department. At present he is sort of a subforeman, and earns more than the other men. He handles much of the lead with his hands. He directs its removal from the vats, the carrying and moving of it from the vat rooms to the packing department.

He has had only one attack, which occurred about Thanksgiving, 1911, after he had been working at this work for about three and a half years. He claims to have been careful in his personal habits and not to indulge too freely in alcoholic beverages. He says the superintendent instructed him to keep his hands clean, but nothing more.

The most interesting part of this case is the effect upon the offspring. He had one child born in Barbadoes. It is living and physically strong and healthy. Since working in lead his wife has had two conceptions; the first ended with a birth before the normal term, at the end of seven months. The attending physician stated that this was really a miscarriage. A second child born a year later lived six months and died in convulsions. Dr. Thomas Oliver states that this result may be expected from lead workers'. In view, however, of the absence of attacks on the part of the worker himself, the case is exceptionally interesting.

(NOTE.—Cases 54, 55, 57, 58 and 59 are those of employees in a Federal Navy Yard, reported to have contracted lead poisoning. They are omitted from this report because the Commission is without jurisdiction to inquire into conditions there.)

*Case No. 56.—Mrs. Myra W—:*

While in the employ of B— and W—, who were engaged in the embroidery business, Mrs. W— who was then unmarried suffered from a very serious attack of lead poisoning. She entered their employ in the year 1901 and had worked two years before she had this attack. She was an embroidery stamper, and she learned when her case was diagnosed by a physician at the hospital that she had been using powdered white lead for transferring the design to the cloth.

She was taken with very severe pains and vomiting. She suffered intensely and could get no relief for some time. She lost three months of work and never returned to B— and W—. She afterward did the same sort of work for four years, from 1903 to 1907, under the employ of another embroidery shop. In 1907, Mrs. W— was married and she now has a little girl, Hannah, who was born January 31, 1909. The child has always been healthy. Mrs. W— thinks her nervous system is still deranged from the effects of the attack.

She is a native of New York city, born in January, 1881, of Jewish parentage. Previous to 1901 she was living in her home with her parents. At the last place where she worked she received \$12.00 for the work of a week which consisted of fifty-four hours, nine hours each day, with one-half hour for lunch.

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<sup>1</sup> See Oliver, *Bulletin of Labor*, 95, pp. 107-111.

These conditions were practically the same at the first place where she worked.

*Case No. 60.—John W—:*

Now 75 years of age, came to this country from Birmingham, England, in 1874. Immediately after his arrival he entered the employ of the New York ——— as a compositor; he had learned the trade in his old home in England and had worked at it since his youth. He remained with the ——— until 1879, when he went to another of the great New York dailies. Here he remained until 1894, when he was pensioned by the Typographical Union. For a time he was an inmate of the Union's Sanitarium and Home for the Aged, at Cold Springs, Col., but did not care to stay there, although the care was excellent. He returned to New York city.

Like most printers, he smoked considerably and has since ten years of age, and also drank a good deal, especially after his wife's death, which occurred before he came to the United States. He was first sick in 1876, shortly after he had come to this country. From 1879 to 1894, while working for the newspaper, he had constant attacks of lead poisoning which finally resulted in wrist drop. This he thinks that he cured by wearing a bandage which he says is made of eel skin, about his wrist. It is probable, however, that after ceasing his employment the lead was gradually eliminated from his system. He is now permanently crippled, due to paralysis and contraction of the toes, which makes it very difficult for him to walk.

*Case No. 61.—Elmer M—:*

A native of Belgium, where he learned diamond polishing. In 1895 he emigrated to the United States and has followed his trade as a diamond polisher in New York city ever since. This business requires expert workers and the wages paid are consequently high. The disadvantage in the trade arises from the fact that the worker is idle perhaps twenty weeks in a year. M— earns about \$56.00 a week, working eight and three quarter hours a day and 48 hours a week; one-half hour is allowed for lunch.

M— had his first attack of lead poisoning in 1908. This was the first illness he had had in his life. At present the man looks healthy and is quite stout.

## II.

### PAINTERS.

#### *Case No. 62.— Moe S—:*

A Russian Jew, has been in this country five years. He has been a painter for 16 years. He is married and has three children living and two dead. Before coming to America, Simpson worked in Germany at K—, but experienced no signs of ill health.

He has suffered from chronic lead poisoning and was recently sick in bed for three months. He has been obliged to change his occupation since his illness, and now takes orders for enlarging portraits, at which he has now been working for two months, at \$7.00 per week. He has trouble with his head and eyes, also dyspepsia and arthritis. His appearance indicates anemia.

In Germany, he says, the men were warned about the danger of the work and many firms used zinc white instead of white lead, though this is more expensive. Long projecting gowns were furnished the men to cover their clothing while at work and also a particular kind of soap with which to wash their hands. Here they wash their hands with benzine which causes unpleasant effects. When he talked to the men with whom he worked here about being careful the employers objected. He seemed rather intelligent and recognized the necessity of something being done to protect the workmen.

When he worked as a painter he earned \$3.50 per day. He usually took very little breakfast before going to work. He did inside work almost exclusively. He did not drink nor smoke.

#### *Case No. 62.— David L—:*

A Russian Jew, twenty-three years old, came to the United States in 1903 and has been in New York city five years.



He is a painter and has worked at the trade five years. Last year he had an acute attack of lead poisoning. He was taken sick on the streets with cramps and suffered with vertigo. He was taken to the hospital, where he remained three months. Although at present he says he is well, he still looks badly and is anemic and suffers with his head when in a closed room.

L— drinks tea and wine, does not use tobacco and eats no breakfast. He is careful to wash his hands in hot water and cleans his nails before eating, and always goes outside to eat. He does not wear a mustache or beard. He changes his clothes at home. His employer is an old gentleman of 85 years and is good to his men. "The boss always tells the boys how to take care of themselves when working with paint. He tells them to wash their hands carefully and not to eat where they work."

L— earns \$3.00 per day when working. He has worked at the P— Hotel and Hotel ———, on inside work. He also does outside painting.

*Case No. 64.— Pincus W—:*

The parents of Pincus W— are Austrians and cannot speak English. Pincus was a painter and was admitted to the hospital July 21, 1910. His case was diagnosed as lead colic. He was discharged on August 6, 1910. On August 4th the blue line was still present.

He suffered from weakness, loss of appetite, abdominal pains, with vomiting and diarrhoea. He still has stomach trouble. He usually ate no breakfast before going to work. By order of his physicians, he changed his occupation after the illness.

He had an opportunity of marrying a young lady with money, which he seized at once, married and bought a candy shop. Since that time they have had one son.

*Case No. 65.— Harry W—:*

Was born in the outskirts of Wilna, Russia, in 1878, his parents being Russian Jews. In 1891, at the age of 13, he began to learn the trade of bricklaying which he carried on until September, 1899. His pay was five rubles (\$2.50) per week when he worked,

which was only about half the year, building operations being stopped the rest of the time by the weather. To make up for this long period of slack, work, when it came, was piled on heavy. From 13 to 16 hours daily were put in, or about 90 per week.

To escape this life, W— came to this country in 1899. Practically all of the twelve years since then have been spent in New York city and at the occupation of painting and paperhanging. At the beginning the wages were only \$3.00 per week, but as he learned the trade, rose to \$15.00 and later to \$18.00 at which figure they have been for the last nine years. The hours are now only 9 per day but the period of unemployment is not greatly shortened. It now amounts on the average to 16 weeks, yearly.

Sometime in the three years between 1899 and 1902, while he was learning the trade, White got his first attack of what looks like lead poisoning. It was a two-day seizure of severe pains in the left kidney. The physicians of the Sick and Death Benefit Fund, to whom W— went, strongly advised him to give up painting. This would indicate that the trouble was a result of lead. The advice, however, could not be heeded and the third day after his seizure found the man back at his job. From then until 1910 nothing of an acute nature occurred, but in that year the kidney pains returned in aggravated form, accompanied by loss of appetite. Four weeks were lost from work by this illness and during the present year an exactly similar seizure caused an equal loss. At present the man is ghastly pale and anemic and complains of pains in the back after any spell of hard, continuous labor.

W— has worked for several bosses in his painting career, only three of whom kept him long enough to fix their names in his mind. All of them allowed one (1) hour for dinner, but none gave him or posted up any instructions for personal care to avoid the lead. He eats a breakfast of oatmeal, bread and tea regularly, smokes ten cigarettes daily, but touches no alcohol in any form, partly from natural antipathy, partly from the physician's orders. He nearly always leaves the job at noon to eat, wears overalls while at work, but goes through no further change of clothing. He washes before meals with cold water and soap-powder, wears a moustache, but no beard. He has found hot and

cold water in the places he worked at, but would like to have these supplemented by towels, soap and a supply of washing soda which he considers very efficacious for the hands.

W—'s wife, born in 1883, married him in 1901. The couple have had two children, a boy (6) and a girl (9) who look plump but pale.

*Case No. 66.—Sam A—:*

Unmarried, is a Jew from Russia. Of Russian parentage, he came to New York in 1904, and has remained here until the present time. He is by trade a paper-hanger, but resorts occasionally to painting as a means of a livelihood. As a paper-hanger he is likely to come in contact with atmosphere filled with particles of paint caused by the sandpapering of painted wood work, as painters are often working at the same time that he is hanging the paper.

From August to October, 1911, he did piece work here, working from 10 to 11 hours a day, with one-half hour off for luncheon, making a total of 55 to 60 hours a week. He earned from \$40 to \$60 a week. From April to August, 1911, he worked as a paper hanger and painter at the P— hotel. He did time work here, working eight hours a day, with an hour off for lunch, totaling 48 hours a week. He earned \$17 a week. Because of the lack of work during the dull season he is obliged to lay off about five months in a year. Since stopping work at the P— hotel, two months ago, he had been feeling wretchedly and has done no work. He suffers from pains in the shoulder and cramps, and complains that his hands are weak. Six weeks ago he consulted a physician, who told him that he thought he had been poisoned with lead. A— says that several of the men who were working at that time at the P— hotel were taken sick and he thought that one reason was because the paint used was ready mixed. A— does not wear a mustache or beard; he does not eat in the room he works in and he is careful to wash his hands before eating. He smokes only in small quantities and drinks a moderate amount, chiefly at meal time. When he is working, he has a very poor appetite and consequently eats a small breakfast.

*Case No. 67.—Eli N—:*

Is a Jew, born in Russia in 1880, of Russian parentage. He came to New York in 1903 and has remained here until the present time.

He is by trade a painter. For the last three years he has been working for himself, hoping in this way to make his work lighter and so raise his general state of health which was not good. He makes from \$13 to \$14 per week; his hours are not regular and he takes from one to two hours for lunch.

In 1906 he worked for a regular contractor. Then he did time work, earned \$18 a week, worked eight hours a day, and from 45 to 50 hours a week and took one-half to one hour for lunch. Because of lack of work during the dull season, he is obliged to lay off each year from three to four months.

About two years ago he had an attack of painter's colic with cramps, pains over the body, swelling of the body and dry mouth and throat. He was at the hospital for ten days, but was unable to work for three months. The poisoning has left no permanent effects but he is troubled often with intense pains and the blue line is still on the gums. He wears a mustache but no beard; he is careful about washing before eating and does not eat in the room in which he works. He smokes from eight to ten small cigars a day and drinks moderately at meal time. He seldom has an appetite when he is working and in consequence eats small breakfasts.

He has a wife, born in 1882, and two children — D—, a boy born August 18, 1906, and E—, a girl, born September, 1908.

*Case No. 68.—Max W—:*

Unmarried, is a Jew, born in Russia in 1882, of Russian parents. He came to New York in 1889 and has remained here until the present time.

He is by trade a painter. His work has been time work; working eight hours a day, 44 hours a week, and with a half to one hour for lunch, depending upon the season; during the busy months the shorter time only being allowed. He earns

from \$15 to \$22 per week and counts in three months as the amount of time during the year that he will have to be idle because of lack of employment.

Winter has had three attacks of lead poisoning, the attacks being just seven months apart. He has been obliged to be idle because of this illness eleven days. When sick he suffered with cramps and pain in the right side; there are, however, no permanent effects.

He does not wear a beard or a mustache. He does not eat in the room in which he works and is fairly careful to hold the food in a napkin so that his fingers will not come in direct contact with it. He does not smoke and drinks only a moderate amount of beer, chiefly at meal time. He does not always eat a good breakfast, because of lack of time.

*Case No. 69.—Nathan B—:*

Was born in Saxony, Germany, and came to America in August, 1888. He did frescoing but did not find the work very profitable in this country. He worked for himself for a time, then for his landlord. It was while working for the latter that he had an attack (acute attack) of painter's colic in July, 1909. Suffered sever abdominal pains and distension. The lead line was very marked. He was crippled for a while and was first treated at home by a physician and then followed the advice of an old German druggist, to whom he believes he owes his life. A short time after this attack, he had typhoid fever and was treated at Bellevue. At last when convalescent he was sent to the country by his priest and after six weeks' work there he returned to the city much improved and has since been working steadily. He still suffers with rheumatic pains in his feet and ankles; uses some tobacco and eats but little breakfast. He drank beer and whiskey but was told to stop it when he had lead colic. After abstaining for 6 weeks he had fever and says, "When I had lead colic they said I drank too much beer, when I had fever they said it was too much water. Now what can I do?" He was married in Saxony in 1888, then came to this country. They have had 12 children—two girls and ten boys, four of whom

are dead. The oldest child is a son, now 22 years old. He received much better treatment and had more work in the old country, but is ashamed to return until he makes good here. They are an intelligent and thrifty German family.

*Case No. 70.—Andrew F—:*

, Was born in Germany, of German parents, in 1877, and came to this country in 1896, living in Brooklyn until the time of his death, Oct. 13th, 1909. His wife does not speak English, so the only information we could get was from a young nephew. F— had no children. He was a painter and paper-hanger all his life. The nature of his attack was acute, and after suffering for four months he lost the use of his right arm—the doctor then pronounced it rheumatism. This illness lasted 15 months and was so severe that he looked like an old man, altho' only 32 years of age.

All that we could find out as to working conditions was that he always washed before eating and usually ate in a nearby saloon. His hours were not regular, and at the time of his attack he had been working on an interior where they used some peculiar kind of red wallpaper.

*Case No. 71.—Joseph B—:*

, Was born in Ireland, of Irish parents, in 1863, was married in 1897 and came to this country in 1900, since then he has lived in Brooklyn. His wife is also Irish, born in 1865 and has three children, thirteen, six and three years.

B— developed lead poisoning while working for himself as a painter and was treated at a hospital, where he remained for about one and a half months and left improved. He is a thin and anemic looking man, altho' he says his appearance is not altogether due to his recent illness. He has always had a strong constitution and an unusually strong heart, but tires very easily since his attack and is very apt to take cold. He attributes his case of lead poisoning to his own carelessness, due to rolling cigarettes and eating with fresh paint on his hands. He also says that he frequently went without any lunch when very busy.

His former occupations could not be recorded as he has been all over the world and worked at all kinds of trades. For many years he lived aboard ship and did odd jobs of painting without any ill effects. He traveled in South America, did farming in Australia and suffered from various tropical diseases, including smallpox. His early life was one of dissipation, but since his marriage he has not drunk to any great extent, altho' he is still an inveterate smoker. On returning for additional information we found that B— is again in the hospital with kidney trouble and a general breakdown; it is not, however, attributed to lead poisoning.

*Case No. 72.— Henry M—:*

Is a Russian Jew, living with his sister and brother-in-law in Brooklyn. He is 22 years old and has always worked as a painter; eight years in Russia and three years in America. He is of medium height, dark, and smooth shaven. When 20 years of age, while painting the outside of a house, he was seized with very severe cramps and was in such a serious condition that it was necessary to remove him to the hospital, where after two weeks he was discharged as cured. This was the first attack that he has ever had and he has not been very strong since, altho' he still continues to paint, working five days a week at \$3.50 a day. He smokes cigars, but is always careful to wash before eating, although his boss has never warned him of any dangers. He was unable to tell me, at the time, for whom he worked at the time of his attack or any job since; he is working at present.

*Case No. 73.— Francis F—:*

A man of 28 years. Is a semi-chronic invalid, due to lead poisoning contracted at his trade, painting, which he has followed since the age of 13. Every year he loses an average of eight weeks, due to recurrences of his symptoms. These include headaches, dizziness, colic and constipation, which are acute; arthritis of the knee, which is practically chronic and the blue line on the gums, which was detected at Gouverneur hospital in 1909, and may reappear at any time. F— is another one of those who first and last

work at painting. He was born in 1883 in Czernowitz, Austria, of Jewish parents, and started to earn his own living at thirteen. He does general inside and outside work, including much sand-papering, which is the worst of all jobs from the hygienic side. In summer he gets an hour for lunch, but in winter due to the early darkness, only a half hour is taken, the men quitting earlier to make up for it. The customary union scale (\$22) was stated as his weekly income when on full time.

Last year F— married; his wife was born in 1883. One child has been born, a boy, who is hale and sound. None of F—'s employers ever cautioned the young man about his work or posted up any notices to any similar effect. He eats a light breakfast regularly; smokes about ten cigarettes a day and drinks as a rule, about two glasses of beer. He eats in the workroom, but always washes first, using cold water most frequently, but hot in the few cases when it is available. His change of clothing is confined to pulling on a pair of overalls in the morning. He wears a moustache but no beard; can attribute his illness to nothing but his occupation, which he recognizes as very dangerous.

As against a meagre cold water supply, which is the extent of the precautions he has met with in his work, he suggests plentiful water, especially in new buildings where it is extremely difficult to get a drop even to drink, and the allowance of ten minutes before the noon-hour to allow a thorough cleansing of the hands.

*Case No. 74.—Morris R—:*

A man who makes a point of good air and solid food for himself and his family, who knows all about the danger of his painter's trade and takes extraordinary precautions against them and who yet has had several severe attacks of lead colic, is Morris R— a man well on in life, residing in Harlem.

R— was born in 1864. He looks older than 47, but explains this as due to the incessant worry due to uncertainty of employment. Due to his aging, R— has of late years refused to work on a scaffold, for fear of falling. Being now kept at inside work, he is in just the worst situation for contracting plumbism. He always get ill after working with paint steadily for several weeks



and so takes great care to vary by varnishing, kalsomining or the like.

This man has had several bad attacks of colic, keeping him in bed each time from one to four weeks. Coming to America from Russia in 1888, and to New York city in 1890, he has been a painter ever since the latter date. Naturally the names of his earlier employers are lost in obscurity. The first one he could readily recall was I— G—, for whom he worked from June, 1908, to March, 1910. In these 20 months, two were lost thro' unemployment, but no period of illness was remembered. During March and April, 1910, he worked for S— & S—, losing one week out of the eight with a frightful colic attack. From May to November, 1910, he was employed by M— S—, here he lost three weeks due to unemployment and one on account of another seizure of painter's colic. J— J— was the next employer. Here the work was very confining and combined with the anxiety and short rations, consequent on eight weeks employment, brought on the worst series of colic yet, lasting, in all, four weeks. From last May down to date, R— has been working for I— G—, mainly in the capacity of an overseer and general manager. In this way **he has been largely out of direct contact with lead, and while owing to another eight weeks slack time in this period has had no recurrence of the colic.** Under all these various employers R— received \$22.00 per week as his wages for 44 hours' work in summer and one hour for dinner, while in winter one-half hour for dinner.

R—'s wife was born in 1867 and married him in 1892. All their seven children, four boys and three girls, were born at regular term, and are alive and in average health to-day, except one, a boy born in 1906, who died within three months of infantile debility. All possible care was lavished on this infant; he was sent to an institution to be under expert care, but in vain. Whether the child's poor physique and early death are not due in some way to the father's plumbism is at least a fair question. The father himself says he doesn't know.

Instructions, either verbal or on signs, were a minus quantity everywhere R— worked. He usually eats a heavy breakfast, but an interesting point is that every morning immediately on

arising he drinks a glass of boiled water, as hot as he can take it. This, he says, keeps his stomach in tone and helps wash out any traces of lead. Two packages of cigarettes and one or two glasses of beer form his daily allowance. He eats in the workroom, washes before eating, in cold water, and wears overalls while at work. Other change of clothing there is none. He wears a heavy moustache but no beard. Fellow workmen who knew him ascribed a certain droop of the eye lids to his lead poisoning, but he himself does not think there is any connection between the two. He has, however, undergone an operation for the eyes for something which, as he describes it, seems to be a sort of opacity of the lenses. There may be a more direct connection here than he suspects.

Neither canned goods, water pipes or any other non-industrial cause seem to apply to this case of plumbism. Cold water is the only precaution R— has found on the job. Hot water, soap, towels, lunch rooms, are all called for in his estimation; but above all some way to compel the contractors to get the water supply into their new buildings as fast as the structure progresses. Often the men are at work on the tenth or twentieth story and the only water in the building is a little tap down in the sub-cellar. If a painter goes after this he loses most of his lunch time traveling up and down. What many of them have to do is to stay up aloft and hold their food between pieces of paper, to keep their dirty hands from touching it. How comfortable a meal taken under such conditions is, needs no telling.

Along with the severe colic which periodically attacks R—, goes equally severe constipation. The growing weakness and stiffness of which R—, although only 47 years old, already complains is manifestly due in greater or less degree, to the recurrent plumbism with which he is afflicted.

*Case No. 75.—Walter L—:*

One spring morning in 1860, L—, then a 16-year-old apprentice press boy in M—'s Printery, left the cards which he was dusting with bronz and gold powder, to go and watch his uncle and a friend paint a nearby house. From that time

the types and rollers saw him no more, and attracted by the freedom and the outdoor life, he became a wielder of the brush. After various vicissitudes in his native country he arrived in America, still as a painter. He does not remember many of his early employers, but 1908 found him at work doing fine interior work and finishing in a private residence, up on the Hudson. In this place he was kept steadily sandpapering for five weeks. This is the process which yields the firm ivory-like finish so dear to the eye of those who can afford it — in this case pure white is applied and allowed to dry. Then it is sandpapered and smoothed and a second coat put on. The sand-papering process is repeated, then another painting, and so on until the surface is like glass. But what about the painter meanwhile? He is living in a cloud of dust — lead, dust — white lead dust, one of the worst of industrial poisons. As L— describes it — “you might as well eat the lead.” Before the five weeks were over he had contracted violent arthritis of the left heel, so painful that he could not touch the affected member to the floor. Still he kept hopping about, working as best he could. Finally he was forced to stop, returned to the city and went to the hospital. There they tested the nervous reactions of his left leg, examined the afflicted heel, advised him that he had been “leaded” and told him to give up painting if he wanted to save himself.

He did leave it, temporarily at least, for twelve weeks he was unable to do any work, and used his time going to the hospital for treatment and nursing himself at home.

Quite a change, this, from the peaceful times in the English printing shop, at five shillings a week, for 60 hours' work. At the end of the twelve weeks, however, L— was back at his brush: losing, on an average, eight weeks yearly through unemployment and always suffering more or less with his leg. He went along till the summer of 1911. Then a violent and painful swelling of the knee on the affected side came upon him, necessitating another twelve weeks' loss, due to lead illness.

Of recent years L— has been a member of the Brotherhood of Painters, and claims to have been getting the required \$22.00 per week for 44 hours, working eight hours per day with one hour for dinner.

L—'s parents, like himself, were English. He married in 1861. In all, he has had eighteen children, but has kept no record of the dates of their birth. Fourteen of the eighteen are now alive, as far as he knows, one of them being in New York and the rest in England. Among the eighteen there were two miscarriages, but these seem due to other causes rather than lead.

No instructions, verbal or posted, were ever given this man concerning the dangers of painting or how to guard against them. In England, due to the custom of stopping work at eight o'clock for a meal, he used to go to work breakfastless. Over here he eats a light meal before starting for the job. Once in a great while he smokes a cigar and occasionally, on a physician's orders, takes a little whiskey in milk. Wherever possible he washes before eating, using hot water in the few cases it offered. When he can't wash he holds his lunch in a piece of paper while eating to keep the paint off it. He wears a moustache, but no beard. Living in a furnished room house and eating mainly in restaurants he can never tell whether he is getting canned food or not, but does not believe he got his lead poisoning that way. The connection between the sandpapering job at the G— mansion and his sore heel is too close to be ignored. As to safe-guards, he has found hot and cold water, and that is all. He suggests the abolition in some way, of the dry sandpapering process, and requiring contractors to get a water supply early into the new buildings.

The knee at present is quiescent, but his left wrist is troubling him with intervals of weakness — a possible forecast of eventual wrist drop.

*Case No. 76.— William K—:*

Was born in Germany in 1860, where in 1876 he began to learn the painter's trade, and working at it for several years in France, much of the time in Paris. K— had to come to America before he got his first attack of lead poisoning; then it got him in 1901. For eight weeks or more his left shoulder, arm and wrist were paralyzed; colic, cramps and constipation tortured him and acute kidney trouble added its complication to the others.

Rest and treatment restored him to his former strength and again things went well until 1905, when another attack, the same as the first, incapacitated him for a period of ten weeks. Since then he has had no acute paralysis or cramp attacks, but the kidney trouble is constant. When interviewed, he had just been discharged after having helped put through a rush job of four weeks' duration. From ten to twelve weeks are thus lost yearly by this painter, who says those are the common conditions in the trade. He gave his wages, as customary, as \$22.00 for a 44-hour week, eight hours per day, one hour for lunch.

K—'s wife was born in 1866 and died in 1908, of tuberculosis. They had three children, the eldest of which was killed in infancy by loose milk. The other two are stocky and strong.

The father himself is a powerful, distinguished looking man, with a face showing much refinement and education. He speaks German, French and English fluently. He wears a mustache but no beard, and is a splendid type. He says no warning of the dangers of the work were ever given him or posted up. He eats a light breakfast of rolls and coffee and smokes about five small cigars daily. Beer and whiskey he takes in small quantities and rarely, other liquors not at all. He eats in the workroom, using cold water most usually. Cold water, and little of that, has been the utmost precaution he has found for the safe-guarding of the painters. No cause other than industrial can be found for his attacks.

*Case No. 77.—Richard W—:*

"Frightful pains in both arms and wrists, especially the right; severe cramps in fingers and right calf; throbbing headaches three or four nights in succession, making sleep impossible; pains in the legs from the knees down, especially in the ankles, which often swell painfully; a swollen joint on the little finger of the right hand which is over a year old and still growing." This is W—'s own description of the chronic effects of the leading he has undergone in his long career as a painter.

W—'s parents were Scotch. They migrated to America and at L—, Mo., Richard was born in 1850. In 1868 he began

to learn his trade. As a young journeyman he received \$18.00 for 60 hours' work a week, having one hour daily for dinner. He moved a great deal about the country and eventually settled in New York, where he has worked for numerous boss-painters in the last 20 years, doing general painting and paperhanging. His hours are eight per day, 44 per week, with one hour (usually) for dinner. He loses from eight to ten weeks yearly through unemployment and occasionally a day or half day because of his lead illness. In 1908 he lost six weeks in succession on account of a violent attack of arthritis.

In 1910 he went to a hospital with a severe ulceration of the lower jaw. From there he was sent to Bellevue, where he was kept two weeks and a section of the diseased bone excised. All his teeth are loose and when one becomes too unsteady and uncomfortable he simply picks it out with his fingers. The lump on his little finger did not look inflamed and is not painful to the touch, but is round and hard like an oakball and keeps on growing. It interferes somewhat with his work, but otherwise his fingers are not affected. He is a fine-looking earnest old man, and it is pitiable to hear his description of his constant pain.

W— has one child, a daughter six years old, who has never had any unusual trouble. His wife was born in 1864 and married him in 1887. No instructions were ever given him to aid in caring for himself about paint, no notices were posted up and the only precaution he has ever found taken was a cold water supply. He knows the value of a meal before coming in contact with lead, but finds it impossible to force himself to eat anything in the morning. He never touches either alcohol or tobacco in any form, always washes before the noon meal, but nearly always has to eat it right where he is working. He wears overalls while at work, but makes no other changes of clothing. He wears no beard, only a mustache. His poisoning can be traced to nothing else but his occupation.

"Put water in new buildings, when and where painters can get it," was his emphatic reply when asked what improvements would help matters.

*Case No. 78.—Carsten K—:*

Has for the past eleven years been employed as a painter at a hotel in New York city, and several smaller establishments in cities up-state. His work has been the general renovating and caretaking of a large hotel, which means, of course, mainly indoor work in confined spaces. As a result he is a chronic sufferer from colic and severe headaches; his disposition has been made irritable and moody, and while of powerful build, he always has the appearance of great illness. In the winter of 1909 he was confined to bed half a week by an attack, but ordinarily the disturbances are not severe enough to necessitate loss of time. Due to the nature of his job, he has lost only eight weeks on slack time in eleven years. His wages have been \$12.50 per week at first, now \$15.00; hours, 48 per week (eight per day with a full day Saturday), and he gets one hour regularly for lunch.

K— was born in Germany in 1859, coming to America in 1881 and New York city in 1882. His parents were Germans of Gentile stock. His wife was born in 1864. They have had two children; one died of rheumatism. Instructions or warning notices were unknown things on every job where K— worked, and he has been a painter all his life. Since working in the hotel he leaves home without breakfast, but has a meal before starting in; this meal usually consists of eggs, milk, bread, sometimes chops or other meat. He smokes about two packages of pipe-tobacco a week and is a heavy drinker. He is also fond of sitting up late nights, thus, no doubt, weakening his resistance to lead or other poison. He does not eat in the workroom and always washes in hot water before the noon meal. Due to the steam heat in the hotels, he takes off all his outer clothes before donning his overalls and wears the same clothes around home that he does to and from work. In his case, part of his ill-appearance, unstable temper and headaches may be traceable to his irregular habits of living, but the chronic or almost chronic colic seems to necessitate lead as cause. It was, in fact, so diagnosed by the family physician.

K— has been singularly fortunate in the character of the place where he works, in the matter of safeguards, as hot and cold

water, soap, towels and washrooms are part of the hotel equipment and freely used by him. Similar provisions on all painting jobs would no doubt be of great benefit to the men there employed.

*Case No. 79.—Walter B—:*

Has had lead poisoning six times in the course of 28 years' painting. The symptoms each time are about the same — lead colic confining him to bed from 8 to 14 days, severe constipation and, at least on one occasion, the blue line on the gums. After each attack it takes about two weeks for him to recuperate his strength so as to return to work, making an illness of four weeks each time seized. Besides that he has been left with chronic affects, namely: distorted, stiff, weak fingers on both hands, a weak right wrist and liability to sudden and severe attacks of cramps in the hands and calves.

B— was born in Germany in 1859, of German parents. At the age of 14 he took up painting, and has kept at it ever since, doing all-around inside and outside work. In 1883 he came to America, and has been in New York city for 24 years. He loses 16 weeks out of every year, on the average, due to unemployment. When employed, he states that his wages are \$22 per week, of 44 hours; eight hours daily and four on Saturday. In summer he has an hour for lunch, but in winter only half an hour. The first two years in America he had three attacks; since then they have come less frequently, the last one having been two or three years ago.

No instructions were ever given B— as to how to protect himself against lead poisoning, as to what the dangers were. No such notices were ever posted. He makes a breakfast of eggs, rolls and coffee before setting out to work. Chews tobacco a little, smokes three or four pipes a day and drinks two or three glasses of beer. He hardly ever eats in the workroom, always being particular to get out of the vicinity of the paint at noon-time. Cold water is the usual kind used for washing. He doesn't change his clothes at home, but wears overalls while at work. He wears a mustache, but no beard. Industrial causes are the only ones leading to lead poisoning in his case. B— is eloquent as to the pre-



cautionary devices which should be installed on paint jobs. He says, put in hot water, substitute zinc for white lead, prohibit the dry sandpapering process, and get a supply of water in new buildings; these, he states, would go far toward keeping the painter and lead colic apart.

*Case No. 80.—Antonio V—:*

While engaged in renovating the offices and wards of a large New York hospital in this city, Antonio V— was suddenly seized with what one of the medical staff characterized as the worst case of lead colic he had ever known. The painter was first doubled up, unable to do a thing. Prompt treatment relieved him, he went to his home, returning to the dispensary for five days for treatment, then resumed his work. When seen at his home some weeks later, he was very polite, but evidently became frightened and inclined to minimize the whole affair. He said he had worked through the attack, going to another job, where he did plastering for a while. This, however, is very doubtful. V— was born in Italy in 1860. He was a small business man, but losing all his money, he came to America in 1901. He seems to have traveled around a good deal for two years, doing nothing in particular, but in 1903 settled in New York and took up painting. He set his weekly wage at \$16. The hours, however, were 8 per day and 44 per week, with an hour's lunch time in summer and half an hour in winter.

According to V— his employer, while teaching him the trade, also instructed him in the matter of personal care. This may be due to the more advanced scientific attitude toward matters of this kind in Europe, the employer being himself an Italian. The man eats a breakfast of coffee and bread, very rarely smokes a small cigar, and occasionally takes a few glasses of wine. He leaves the workroom to eat most of the time, and washes usually in hot water, before beginning the meal. He wears overalls, but does not otherwise change his clothes. He wears a mustache, but no beard.

Water and soap powder to wash with and cheap canvas gloves to work in are the suggestions this man makes as to what precaution-

ary devices he feels might be beneficial. He says he retains no ill effects of his attack.

*Case No. 81.—Frank B—:*

A very peculiar case is that of Frank B—, a young painter living on the lower East Side. Apart from one severe attack of lead colic in 1903, he has had no apparent disturbances. But for the past ten years, beginning six years after he took up the trade in his boyhood, all the finger nails of both hands have been in a pitiful condition. They are blackened, corroded, and in many cases eaten away half way to the quick. He has several times had them treated, but their condition remains unimproved. One physician told him plainly they would never improve until he stopped painting. "What shall I do?" he said, "painting is all the trade I know." In addition to the corroded nails, his fingers frequently have spells of numbness or paralysis, during which it is impossible for him to hold or wield a brush.

He gave the union scale of wages (\$22) for 44 hours' work. The time lost by B—, due to his plumbism, is slight, being only a day or a half day at long intervals, but he reports from 8 to 12 weeks lost yearly, due to slack time. "They rush us to death on the job," he declared, "and then worry us to death by making us hunt for a new one."

B— is unmarried. He was born in Roumania in 1879, coming to this country before his tenth year. No instructions were ever given him as to the insidious and far-reaching poison he was working with, or how to guard against it, nor were any such instructions posted in any place he worked. He is accustomed to eating a light breakfast, smokes a package of tobacco per day, in a pipe, and drinks daily two glasses of beer. He is wise enough never to eat in the place he is working in if he can help it, and always washes his hands carefully in cold water before a meal. He wears overalls over his clothes while working and keeps the same clothes on after quitting work. He uses little canned goods and there is no adequate non-industrial cause for his being "leaded." The precautionary devices his employers have favored him with are limited to cold water for washing purposes,

which he thinks might well be supplemented with a hot water installation, giving a full hour for lunch, and providing adequate ventilation. "Closet work," as he calls it—the painting in a close, shut-in room, with pure white lead, in bathroom and clothes closets, he looks upon as the most dangerous.

*Case No. 82.—Joseph M—:*

Forty years old, has worked for the same painting firm since he was nineteen. Thirteen years ago he had a slight attack of lead poisoning. Since then he has had three very serious attacks, and to-day is so badly leaded the doctors say he will never be a well man. He is not able to work more than four and a half days weekly, because of wrist drop. His left foot is partially paralyzed, no feeling in it at all. He suffers so from dizziness that he can do no outside painting where it is necessary to use scaffolding. Lameness in the muscles of the right hand has caused the hand to become twisted and distorted. His appetite is poor—rarely eats but the lightest breakfast. Claims he is fond of alcoholics and never drinks less than three pints of beer daily. In appearance he is white and anemic. Both children and their mother are healthy. The man claims that having but one-half hour for lunch, and only cold water with which to wash, it was impossible for the men to properly clean their hands, and that he was certain his own poisoning was the direct result of eating with hands covered with lead.

*Case No. 83.—Fritz H—:*

Was born in Basel, Switzerland, in the year 1842. His father had followed the trade of painter before him and the son naturally enough entered the same trade. Mrs. H— remembers very well when they were married, that his father warned her of the dangers of the painting business and asked her to see to it that he always took proper care of himself. They came to this country about 1871, and H— pursued his trade in this country. Like all painters, he worked here and there for one painter and then another. During his entire life he enjoyed the best of health until he was suddenly stricken, about nine days before his death, with

acute plumbism. He had never, up to this time, had any of the symptoms of lead poisoning. Even then he did not go to bed, but remained at home and walked around. His hands and fingers became paralyzed and he had intense pains in his ankles and instep, and his big toe turned black and blue. During the last few days he was mentally unbalanced.

Mr. H— took excellent care of himself, washing carefully and changing his clothing frequently. He always recognized the danger of his profession and for this reason took extraordinary precautions. The last job he was in before his attack was the painting and enameling of some small rooms and closets in a big apartment house. Here he had to put on a coat of white paint and then sandpaper it, later putting on one other coat and sandpapering it down. Still later he put on the enamel.

He was a union man, worked the regulation 44 hours a week, eight hours per day. One hour for lunch in summer and one-half hour in winter. For this he received \$4 per day. He was abstemious in his habits, smoked some and drank a pint of beer now and then.

*Case No. 84.— George K—:*

In 1899 K— was occupied in a painting job in New York city which involved the scraping off of large quantities of old paint. His knuckles became cut and chafed, and it was not long before his hands had swelled to twice their natural size. The knuckles festered and ulcerated, and his hands had to be carried in slings for six weeks. The physician who treated him said that undoubtedly the lead had worked in through the cuts in the knuckles, poisoning the tissue. Although K— is an old man, this is the only trouble he has had which he can definitely trace to lead.

He was born in Kinselan, Germany, in 1844. He was married twice. The first wife had one child still born while K— was painting, and four of the children of the second wife died between the ages of two and five.

K— experimented with several occupations in Germany, but when he came to America apprenticed himself to a painter. This

he completed in 1870, but did not enter the trade immediately, driving a truck for the fire department some time. He has worked at the painter's trade thirty-one years. In this time he remembered losing only 24 weeks altogether due to unemployment, a remarkable record if correctly recalled. In this period came the six weeks attack of poisoned hands already mentioned. The pay during the latter part of this period is given as \$22 per week, 44 hours work, with one hour daily for lunch. Since 1909 K— has been custodian of the union headquarters.

K— used to wear a full beard. He looks old and bent, but was apparently once stalwart and strong. For breakfast every day he consumes meat, potatoes and coffee, uses no alcohol, but smokes a pipe. No instructions as to the danger of the trade were ever given him, or posted up where he works, and hot or cold water is all the protection he has ever found extended to him or his brother painters. He eats in the workroom after a wash in the water, either cold or hot, which is furnished. Wears overalls, leaving the rest of his clothing unchanged. The most needed improvement seems to him to have the employers put water in the buildings early in the construction.

The only permanent effect in Kruger's case is a stiffness of the hands.

*Case No. 85.— Paul T—:*

Is a native of Wurtemberg, Germany, and has been a painter since he was ten years of age. He, like many another young German, has had the "wanderlust," and has wandered in Germany, Switzerland, France and Africa (Tunis.) In the latter place he met his wife, and they were married in 1892. One year later he came to the United States. (1893.)

He had his first attack of lead poisoning in Paris, where he was doing some fine interior decorating, which he described as Louis XIV style. He had been working long hours, from 6:00 a. m. to 11:00 p. m. It was after this time that he went to Tunis, and later to Paris, and finding no work there came to the United States. He immediately found work in a large apartment house that gave him employment until the following spring. He then got employment as a house painter and decorator at the Hotel V—, where he remained twelve and one-half years. Here

he did painting and decorating work of the finer sort and had charge of a large gang of men who were under his direction. When the hotel went out of business, he did several jobs for small houses in Jersey. His first attack in this country came when he was working at the Hotel P—. A strike had delayed the work and when the men came back they were pushed to the limit. While working on the decorations in one of the large banquet halls he was stricken with lead colic and was disabled for four weeks. His work from that time forth became rather irregular, although he worked for one or two firms. Most of his work was of a fine grade and he did considerable work in private houses where it was necessary to use white lead, to sandpaper and to strip the work. Last March he got a job at the new F— Theatre, where he was employed on the interior decorations. He held this for a couple of months, and then got a job doing some exterior painting. After a short illness, he found work at the G— Club House. Here he was engaged on the big banquet hall and was working steadily and very hard. The work was of the very finest quality, and he had just about completed it and was ready to varnish when he “keeled over.” He says he does not know how he got home, the attack was so sudden and so complete. Since that time (July 1) he has been out of work, almost wholly incapacitated. His left hand is almost wholly useless (he uses both hands in painting and is left handed), and his right is partially affected. His knees and ankles are also swollen and give him considerable pain. He says that after he had his last attack his whole body seemed to be stuck with pins and needles. He has always been scrupulously clean and has worked carefully and taken good care of himself. He described how, when working at the F— Theatre, he had to eat in the same room where he worked, and how he would only partially unwrap his sandwich and eat it out of the paper to prevent his hands from touching it. Very few facilities are ever provided for workmen and the short lunch hour, especially in summer time, makes cleanliness more impossible than godliness. He wears a thin mustache, smokes a pipe, drinks a pint of beer every evening.

He is very intelligent about his work, and he brought out clearly the dangerous substances, laying special stress on the

qualities of white lead which were the worst. He also decried the use of cheap turpentine which aided the poisonous lead. He belongs to the union and has worked to regulate hours, and has received union wages. He declares, however, that the bosses overwork the men whom they pay \$4.00 per day, and they get little time for rest or to wash.

*Case No. 86.— Marcus R—:*

A stocky, swarthy man, with a heavy black mustache, is Marcus R—, who started in life as a shoemaker in Warsaw, but, not sticking to his last, has embraced the painter's trade and with it its ills — colic, cramps, paralysis of the wrist and arm, and maddening inflammatory pains in the knee.

R—was born in Warsaw (Russia) in 1873. He married in this country in 1898, his wife now being 44 years old and having borne him seven children. One of these died in its first year, in 1902, of summer complaint, and another almost as soon as born, in 1907, being deprived of its mother through her own illness. Nothing was found to indicate that either of these two deaths was due to lead poisoning. The other five children, aged 11 to 1, are all alive and well.

To return to R—'s industrial history, he started his career as a wage earner at the age of nine, in M— J—'s shoe-making emporium in Warsaw. After serving his apprenticeship, he received 4 to 5 rubles(\$2 — \$2.50) a week as a laster, working 69 hours a week. He says he lost no time while thus employed, but in 1902 threw up the whole job and came to America.

Here he somehow fell into the painting trade. For four years he worked at this, receiving on the average \$9 for a week of 48 hours. Then a period of slack time sent him back to shoemaking; but the \$4 to \$5 procurable in this way for a 58 hour week failed to appeal to him, and within a month he had hunted up new employment at the less ill-paid but more dangerous trade of painting. From January, 1907, to the present he has stuck to this, his present employer being J— L—.

R— has now been ailing with colic, wrist paralysis and pains in the knee, on and off for five years. No warning of the dangers

of the trade was ever given him, nor instruction for self-protection. No safety devices have ever been known to be applied on the jobs he was sent to. He eats breakfast regularly, smokes a package of cigarettes a day and imbibes perhaps a pint of beer. As a rule he cannot help eating right "on the job," washing his hands first with hot or cold water when either is available, change of clothing is limited to the use of overalls. No new water pipes have been installed in his residence, and he very seldom eats canned goods. No other cause can be described for his "lead" condition than the occupation at which he earns his bread.

*Case No. 87.—Martin W—:*

Is an intelligent and progressive young man, was born in Kalvary, Russia, in 1872, of Jewish parents. He never married, finding his hands full earning a living for himself. He lives on the lower East Side of New York city, and is an influential member of his local of the Brotherhood of Painters, Paperhangers and Decorators. Painting, his only occupation, he took up 22 years ago, in this country, working for nine years steadily for the same employer. In February, 1898, slack time caused him and this "boss" to part company, and since that time W— has shared the common lot of the painters, hardly ever having the same employer for more than a month or two at a time. He is at present working as a general painter.

W—'s first siege of lead poisoning came seven years ago, when, after 15 years at the trade, he was suddenly seized with general paralysis. After a week flat in bed, accompanied by vigorous treatment with epsom salts, he was able to crawl about, and made his way to the New York Post-Graduate Hospital, where three months' electrical treatment as an out-patient fairly restored him to vigor. The debility resulting from his seizure, however, has lasted down to the present date. He is drawn and bent, his face weazened before its time. Added to his chronic afflictions is also arthritis in nearly every joint in his body, manifesting itself in severe pains and stiffness.

The second poisoning climax in W—'s life was three years ago, when he lost two full months, due to wrist drop. All through



April and May, 1910, he could not raise his right hand and was utterly unable to manipulate a brush. A repetition of the epsom salts and electricity eventually gave him back the use of his wage-earning hand, and since then he has had no acute attacks, although the chronic debility and arthritis are still with him.

In common with all other painters, W—'s face was a study when asked what precautionary measures had been taken to protect the workmen on the jobs he had worked on, and whether the employer had given any warning as to the dangers of the trade. When he could speak, a vociferous and expressive "No!" was the answer. When it came to protective devices, however, he had many to offer, namely, in the line of affording adequate facilities for personal cleanliness. "Let the employer put in hot water, soap and towels for us," he said, "and give us time to use them, and we'll be all right. When a man's only got half an hour for dinner, he can't very well spend the 15 minutes necessary properly to get the paint off his hands and out from under his nails. If the painters got a chance to wash at noon, then by careful brushing of the teeth and keeping the bowels free, there would be little chance of their getting poisoned."

Aware of the added susceptibility to lead-poisoning that comes with an empty stomach, W— made it a practice almost invariably to have a meal before going to work in the morning. He confessed to smoking 15 cigarettes daily, but was little addicted to spirits, a glass of beer or whiskey once or twice a week being his limit. As a rule he ate in a lunch room, leaving the job if at all possible, and always washing with hot water in the few cases it was available, otherwise with cold. His change of clothing consisted of pulling on a pair of overalls, or in hot weather substituting these for his trousers. Canned goods were rarely used in his home, no new water pipes had been installed there, and there was no reason to believe he got "leaded" in any other way than through his occupation. He wears a mustache, but no beard. He gave the regulation statement, \$22 a week and 44 hours.

*Case No. 88 — Tubal B—:*

Weight, 180 pounds at 17, 130 pounds at 36 — such is the progress backward of Tubal B—, for 26 years a painter.

Thirteen years ago, after 13 years at the trade, B— had his first plumbism attack. Suddenly one night he was seized with cramps, nausea and vomiting. His appetite was gone, he became subject to spells of having everything go dark before his eyes. This state of affairs lasted eight months, when he was able to resume work. Since then, regularly at the return of cold weather, he begins to undergo a similar, although not always so keen an experience. This lasts for several months, and wears away with the coming of spring. Seven years ago paralysis caught him in the arm. Eight and four, and again at three years ago, he had the characteristic blue line on the gums, but no traces of it can be made out at present. So many and long-recurrent seizures have now left him with chronic anemia and neuritis; of the latter he had a particularly excruciating attack last May.

B— was born of Jewish parents in Russia, in 1874. In 1899 he married, his wife being then 18. His three children enjoy average health and apparently have inherited no weakness from their father. He never saw any precautionary devices employed to save painters from lead, but suggested plenty of water, soap, towels, and above all, time to use them. In the customary meal time of half an hour the painter has little chance to protect his health. No instructions or warnings for self-protection were ever given him by his employer; he eats breakfast, as a rule; smokes 15 to 20 cigarettes daily; takes a glass of beer perhaps once a week; washes in cold water before lunch; wears overalls on the job; uses very little canned goods; wears a mustache; has no new water-pipes in his house; and there is no cause for his poisoned condition evident except his becoming leaded through painting.

*Case No. 89.— John R—:*

Thirty-two years old, married, and living in a quiet corner of the Borough of Queens, began his career as a wage-earner in June, 1895, as an employee of one E—, a boss painter, in Boston. For nine years, till November, 1904, R— worked for this one man. In the nine years he lost about 50 weeks, due in part to slack time, in part to illness.

He turned lumberman, going to West R—, Vt., where he worked for the West R— Lumber Co., a 60 hour week for \$25. A shut-down of the plant sent him back to painting.

Rice says his illness varies largely with the sort of paint he is using. When working with lead paint he at once and invariably is attacked by pain and swelling in the feet, cramps, severe headaches, vomiting, nausea and temporary lameness of the wrist. He often has to go to bed for a day or two at a time. He is a powerfully built man, but says the lead keels him right over. Paint containing no lead does not bother him.

Due to this experience, R— forcibly advocates experimentation to discover a substitute for lead in paints. This would strike right at the heart of the matter. In the meantime, or failing of this, he advocates compelling the employers to see to it that a supply of water keeps pace with the painters on a building, the supplying of towels, and a longer period for lunch.

R— was born in Russia, of Jewish parents, in 1879. His wife, now 30, he married in 1902. They have two healthy children. No warning was ever given him against the dangers of the work, no protective devices were ever seen on the buildings where he was employed. He is clean shaven, usually has breakfast, consumes 10 cigarettes and one glass of beer daily, and changes only his overalls. He is careful to eat in a separate room from where he is working, and uses benzine in default of water to wash with. His family uses little canned goods, there are no new water pipes, and his plumbism can be laid only to the door of his trade.

*Case No. 90.— Edward I—:*

Colic, wrist drop, lasting from two hours to two weeks, sick headache, sharp pains in joints, darkness before the eyes, floating specks in field of vision, inflamed and watery eyes, with drooping eyelids, lame spells of arms and legs, chronic kidney trouble, chronic gastritis, operated on three years ago for appendicitis, but strongly doubting the reality of the appendicitis — so reads the history of Edward I—.

I— was born in Russia in 1862. His parents were Jewish. In 1883 he married, his wife having been born in 1864. They have had seven children, of whom the youngest, G—, aged nine,

has a weakness of the wrists and hands closely resembling his father's. Two other babies died in their first year through malnutrition. Painting was the first trade I— took up, and he has stuck to it. He does general inside and outside work and paper-hanging, his present employer being M— P—, a boss painter of the Bronx. The wages and hours were again stated as \$22 and 44, but even if that were true, from six to eight weeks are lost yearly from the effects of the lead poisoning.

I— was greatly amused when asked whether his employers had ever warned him of the risks of the trade. He had never heard of any protective devices being used; his suggestions were the usual ones of plentiful water supply and more time to utilize it. He finds himself unable to eat much breakfast, but always takes at least a glass of milk before starting to work. One package of cigarettes and one glass of beer per day are his limit; a little wine occasionally on festive occasions. Sometimes he eats in the work-room, but not if he can help it. Cold water is the usual thing for washing, and no change of clothing is made beyond overalls. Canned goods are almost unknown in his home, and there are no new water-pipes. The disease from which he suffers can have come from no other source than his occupation.

In spite of his serious illness, he looks well; he wears a mustache, which is slightly tinged with grey, like his hair.

*Case No. 91.— Fred J—:*

Numbness in arms and wrist, headache, darkness before the eyes and colic for several hours or a day are the peculiar ailments from which painter Fred J— suffers when an attack of lead poisoning is on. He has had a more or less severe attack nearly every year, as the cold weather draws on — probably, he thinks, because of more inside work being done then. So far he has been able to work through all his sick spells.

J— was born in Russia in 1883, of Jewish parents. He married in 1909, his wife being then 21 years of age. They have no children. From January, 1902, when he began working, up to January, 1907, J— was a cap-maker in Russia, being paid 6 rubles (\$3) a week for 18 hours a day. The young workman

was a Revolutionist, so the Russian government laid its strong hand on him and threw him into prison. Released in some way after four months, he embarked for America, and in September, 1907, found him employed by the painting firm of L— and Co., where he still is.

J— does both interior and exterior work. He makes a practice of eating breakfast before going to work, but does not change his clothes at the job any more than to pull on a pair of overalls. He wears a mustache, uses no tobacco, but takes two or three glasses of beer weekly. He washes his hands with cold water whenever he can get it, which, he says, is rare on new buildings.

He recommends that contractors be compelled to lay in a water supply for use of painters, and thinks that a clean lunch room, free from paint, would be of benefit. He has lost no large amount of time through lead illness, but is always under some form of annoyance from it, and thinks it cannot be too strenuously guarded against.

*Case No. 92.— Samson K—:*

Living on the Upper East Side of Manhattan, was born in Minsk, Russia, of Russian Jewish parents in 1879. In 1905 he married, his wife being born in 1886. Two children have come to them, E—, born in 1906, and G—, in 1909. Both are in fair health and strength.

Since his sixteenth year K— has been a painter, it being his first and only occupation. Since May, 1911, he has been employed by S—. He does inside and outside work.

Lead poisoning has manifested itself in him in paralysis of the arm and severe arthritis pains, lasting at various times from two days to a week. He loses little time, however, for the necessity of earning a livelihood for his family drives him out to work even when he is really not in condition for it. No precautionary devices were in use on the buildings where he worked, but among those possible he laid great stress on the necessity of having water to wash up with. Often on new construction work painters have to go all day without a drop to drink, much less to wash with.

The inevitable consequence is eating with dirty or imperfectly cleaned hands, with the resultant ingestion of lead. Hot water and soap would infinitely lessen this danger.

No warning or instructions as to the dangers of the occupation were ever given him. He always breakfasts before going to work, smokes about a pack (10) of cigarettes a day, and takes in the same time perhaps two small glasses of whiskey. He nearly always eats in the place where he is working, thinking it unavoidable, but tries always to wash up before lunch, using hot water in the few cases when it is procurable. He wears overalls over his trousers in winter and instead of them in summer, and always removes his coat when at work; otherwise makes no change of clothing. He is clean shaven, seldom uses canned goods, no new water pipes have been put in at his home, and his poisoning can be attributed to no cause other than his occupation.

*Case No. 93.—Paul H—:*

Suffering from severe intestinal cramps at intervals for two years, Paul H—, a rugged old man now aged 47, but looking 60, was told in 1909 that he had appendicitis, and sent to the Presbyterian Hospital. There the fact that he was a painter, used to doing inside work exclusively, came out, the diagnosis was changed to lead poisoning, and he was removed to Bellevue, where he staid for 14 days. All through this attack he had faintness, dizziness, severe headaches and general debility. His toenails also turned black and were extremely painful. Since his discharge from the hospital he has been fairly well, except for splitting headaches which occasionally overtake him, and frequently a spell of dizziness while on a ladder.

H— was born in Galacia in 1864. His parents were Galician Jews. At the age of 12 he began to learn the painters' trade, and has stuck to it ever since. When asked whether he did not realize the dangers, he replied: "Of course, but what can I do? Bread must be had." Even at that, he lost ten weeks in the past year, due to slack time. Every year he says he is forced to lose as much or more when he is able and willing to work. This precariousness of occupation he declared to be common to all painters,

except a few who might be able to find permanent berths for themselves.

H— has one child, a daughter of 20, who has always been large and robust. His wife was born in the same year he was. He always eats breakfast before working, uses about one-half a package of smoking tobacco a day, and in the course of the week may take two or three glasses of beer; he drinks whiskey in small quantities at long intervals. When lunch time comes he always, if possible, goes to a saloon to eat. If he must remain on the job, he is very careful to keep his edibles out of contact with paint or paint dust. He washes with hot water where obtainable. He wears a mustache and pulls overalls on over his trousers. His coat and vest he usually removes, but that is all, except in summer, when he takes off his trousers before putting on the overalls. No canned goods are consumed in his home, and his lead illness can be due to none but industrial causes.

*Case No. 94.— Frank G—:*

A painter by trade, has had two serious attacks of lead poisoning, contracted while working under unfavorable conditions. He suffered from his first attack while under the employ of S— & Co., painters, in November, 1898. Mr. G— worked for this company at several different times, amounting, he thinks, to about ten years. The nature of this attack was colic — a general stiffness and a feeling like rheumatism throughout the body. The duration was three weeks, though he thinks he was absent from work only from November 9-18. At about this time his daughter, O—, born April, 1898, also suffered from an attack of lead poisoning. The doctor found she had chewed the corner of a tile which was among her playthings. The child recovered and lived until 1901, when her death was caused by diphtheria.

Mr. G— and his wife were born in Germany in 1868 and in 1876, respectively, both of German parentage. They were married September 16, 1894. Mrs. G—, who is a nurse, seems to be a strong woman, and says her health has always been good. There are two daughters in excellent health and strength — K—,

born April, 1895, and W—, August, 1900. There were no miscarriages and no other children lost except the one mentioned.

The second attack occurred while G— was employed in the capacity of painting and scraping dry paint at S—, L. I., G— began work at this place October 17th, 1908, left with a very severe attack of lead colic December 22, 1908, returned to work January 9th, 1909, and was laid off February 1st, 1909. There was a threatened strike. Mr. G— was spokesman, and when the number of workers was reduced one-half, he was one of those to go. Beginning August 24, 1909, he was employed for seven months by J— F—. From May 28th, 1911, to July 27th, 1911, G— was employed by F— B—, sign painters and general painters. At this time he did enameling, sandpapering and rubbing. Between July 30th and November 9th he was employed by four different firms. His "decorating" usually includes painting white woodwork, enameling and sandpapering paint.

During the time from July 30th, 1911, to November 9, 1911, he lost two weeks time because he was unable to find work when the job was finished. Sometimes there was a "lack of work" on account of some delay in the job. Mr. G— is a strong union man. His wage is \$22 for a 44 hour week.

He finds no preventive measures used by companies employing painters. The running water in the building is usually shut off. Two pails of cold water may stand in the over-crowded dressing-room in which forty or fifty men are supposed to wash their hands. One-half hour is the regulation time for luncheon. The workmen may be on the eighth floor and have to hire the elevator men to take them down. Sometimes they try to clean their hands in the pail of benzine which is given them for cleaning certain brushes. The cold lunch has been all the morning in the paint-laden atmosphere. There is no chance to get proper food or to eat with any degree of decency. The men are rushed back to their tasks, weary and overstrained. A minute lost may mean the loss of his job, for each man has a task, and the ever-watchful eye of the foreman means to see this task accomplished. Mr. G— sees great chance for improving conditions. He says there should be running water in the building, with a supply of hot water at noon, and convenient clothes rooms. That



the men should have enough time at noon to get a warm meal comfortably. The long hours of heavy work, with insufficient nourishment and rest, weaken the physical condition and make it more susceptible to the poison. He also says ventilation is sorely needed in some cases. In many of these places where he has worked the rooms have been made very close, especially in the cold weather, since the enamel will harden too quickly if it is too cold. He says when one opens the door to enter it seems almost impossible to breathe. He eats a good breakfast before going to work; smokes a pipe, but not to excess, unless he is overstrained from his work. He occasionally takes a glass of beer. In the summer season he removes his overalls before coming home, at other times he removes them as soon as he gets home. He wears a mustache, but no beard. The family seldom uses canned goods, has used no new lead pipes, and cannot attribute the poison to other than industrial causes.

*Case No. 95 — John C—:*

John C— was born in Ireland in 1851. He came to the United States when he was 20 years of age, and has lived in New York city ever since. He has worked at the painters' trade since he was twelve years old. He married in 1874 and they have one child, born in 1879.

C— was employed by various firms as a foreman painter. His weekly wages were \$22.50 for 44 hours work — eight hours a day and four on Saturday; one hour allowed for lunch.

His first and only attack of lead poisoning occurred in 1908, when he suffered from pains in the stomach and had trouble with his gums. He has never been well since, and is now in Bellevue Hospital, suffering from dropsy.

C— had potatoes, meat and coffee for breakfast. He used a good deal of tobacco, and drank whiskey and beer.

He was accustomed to eat in the workroom; he changed his clothing on leaving work.

*Case No. 96.— Friedrich R—:*

Came to this country from Germany in 1883, when he was 21 years old. He was a painter by trade and for years he did odd

jobs, mostly painting. For the past ten years he has worked every summer at the B— Institute.

R— was married in 1889. They have no children. The wife had one miscarriage, in 1890.

R—'s usual weekly wages are \$22 for 44 hours work; eight hours per day, four on Saturday. He has one hour for lunch. He allows for about 20 weeks idleness per year.

R— had his first attack of lead colic in July, 1893. He had severe cramps, and in later attacks wrist drop developed. He had attacks in 1897, 1898 and 1902. At the time of the latter attack he left the city and went on a farm in New Jersey and stayed until 1907. Here the wrist drop disappeared and R— has had no recurrence of the attacks.

R— never received any instructions concerning the dangers of the work. His breakfast consisted of meat, rolls and coffee. He usually washed in cold water before eating and changed his clothing on leaving work. He smoked cigars moderately; drank beer and whiskey in the morning.

*Case No. 97.— Samuel C—:*

He is a native of Austria, who came to this country in September, 1892, and immediately took up his trade of painting. From 1895 to 1905 he worked for a man by the name of S—, in Brooklyn. After 1905 he worked for himself. His work was largely interior painting, though he did some outside work. Four years after coming to America, C— married. There have been no children.

When C— was employed by S— he worked 54 hours a week, nine hours per day. He was idle about twelve weeks during the year. His wages were \$12 per week. When he worked for himself he had no regular hours and earned about \$10 per week. It was necessary for his wife to work in order that they might live comfortably.

C— had his first attack of lead poisoning in April, 1909, and was never well after that. He had a second severe attack in August, 1910. The third attack, in August, 1911, proved fatal.

The symptoms were severe pains in the stomach, headache and loss of appetite.

C— had been a strong, healthy-looking man even after his first attack of lead poisoning, so his wife says.

It is evident that Mr. C— took no precautions to protect himself from the dangers of his occupation. He did not realize these dangers until the doctor told him, in 1910. He was accustomed to eat in the workroom and usually did not wash before eating. His breakfast consisted of eggs, oatmeal and coffee. He smoked cigarettes to excess, used whiskey and beer moderately.

## CHAPTER V

### ANALYSIS OF LEAD POISONING CASES.

#### 109 CASES OF LEAD POISONING.

Of the 376 cases of lead poisoning which were found in the city of New York during the years 1909, 1910 and 1911, 109 were thoroughly investigated. The results of those investigations have been tabulated, and are presented herewith in a series of tables.

While the number of these cases is so small that any conclusions based upon them may possibly be fallacious, yet they will indicate the trend of the situation. In the groups where there are the largest numbers, they will represent with fair accuracy the conditions that exist among all the workers. Remembering, therefore, that the number of cases here presented is too small a number on which to base large generalizations, the writer presents these analyses in the hope of shedding a little light on conditions as a whole.

Table I shows the occupations of the workers in various lead industries and their ages at the time of the first attack of lead poisoning. Over one-half of the workers are taken before the age of 45 years — before, therefore, they have reached the limit of their productive power. It will be noted that, on the whole, the white lead workers are attacked at an earlier age than the painters. This is probably due to the greater virulence of the white lead, and also due to the slower absorption of lead by the painters.

The nature of the disease is described in Table II. The cases are divided between acute attacks and chronic cases. An astonishingly large proportion of the cases, 62 out of 109, are classed as chronic lead poisoning, which means that the workers are habitually ill. One of the most far-reaching effects of lead poisoning, as pointed out by Dr. Oliver, is its effect upon the genital functions, particularly among women. Most of his evidence, however, is concerned with women who had actually worked in lead. The data, therefore, showing the large number of still-born children and children who did not reach one or two years of age, is exceedingly interesting.

Lead poisoning does not always show itself in exactly the same way. The symptoms vary from individual to individual. Usually the disease attacks the weakest part, or the part which has been used the most, as, for example, the arm and wrist of the painter. The least severe form of lead poisoning is that of colic. This is often so slight as to cause no absence from work. Usually, however, the colic becomes more and more severe, and gradually more serious symptoms, such as wrist drop, paralysis or encephalopathy develop.

Table III aims to show the character of the lead poisoning in the 109 cases which were studied. It is very often the case that a single individual might have several symptoms, and it is evident that almost all had colic. Six cases of death were studied, death usually resulting from lead poisoning and a combination of other diseases. The really serious cases are those under paralysis and wrist drop. Here we find the chronic cases where the greatest loss of time and wages is to be found.

Table IV, which shows the wages of the workers at the time of the attacks, is very illuminating. It will be noted that none of the white lead workers were earning more than \$13.99 per week. The old theory that a man is compensated for the risk he takes seems to be fallacious. The painters, however, make fairly good wages, most of them earning \$22.00 per week, which is the regular union wage. The painter, however, must average in his yearly earnings at least two months of idleness, which considerably reduces his income. In comparison with Table IV, the following table, Table V, is very interesting. It aims to show the amount of earnings lost on account of lead poisoning. The economic loss, it is quite evident, is a great one.

Table VI shows the amount of time lost by the workers in various occupations. Many of them, it will be noted, were unemployed from seven to twelve months; the greater part, however, lost from one to three months. Amplifying this information, Table VII shows the length of time the workers had been employed, and the amount of time lost. There are a surprisingly large number of workers who have been employed less than six months, but who have lost considerable time on account of lead poisoning.

Table VIII gives the length of time the men in the various occupations had been employed. While a considerable number had been employed six months or less, still there are large groups of workers, even among the white lead workers where we should expect to find the greatest amount of casual labor, a considerable group who have been at the work more than one year.

Probably the most important preventatives of lead poisoning are the proper personal habits of the workmen. These are described for this small group of workers in Tables IX, X, XI, XII, XIII. These tables, which are self-explanatory, show some very important facts: (1) that a very small proportion of the men were instructed as to the dangers of lead, (2) that an even smaller proportion found warnings posted in their work places, (3) that most of the men ate in the rooms where they worked, (4) that where they worked most of them had to use cold water, which is almost useless, (5) that while some of the men were excessive drinkers the majority were temperate. These facts seem to show clearly certain fundamental defects in our methods of handling this disease, and in our methods of preventing it. There is absolutely no excuse for these men being exposed to lead poisoning and not warned of the dangers and how to protect themselves. There is equally no reason why these men should not be provided with the fundamental preventatives, such as warm water and a place to eat away from the dangerous poison.

Lead poisoning is preventable, at least to a large degree, and the analysis of these cases demonstrates how careless employers have been, how careless the State Departments have permitted them to be and how ignorant we all have been regarding the true conditions.

TABLE I.  
OCCUPATIONS OF WORKERS IN LEAD INDUSTRIES AND AGES OF WORKERS AND TIME OF FIRST ATTACK OF  
LEAD POISONING.

	Less than 25 years	25-34 years	35-44 years	45-54 years	55 years and over	Information lacking	Total
White lead workers	4	10	5	4	..	..	23
Workers in lead acetate	1	1	..	..	..	..	2
Lead oxide workers	..	2	1	..	..	..	3
Casters (gold, tin, foil and lead alloys)	..	4	2	3	1	..	10
Dry color workers	..	2	1	..	..	..	3
Using lead as a hardening agent	1	3	1	2	..	..	7
Sealing paint, battleships	..	1	2	2	1	..	6
Ship caulker	..	1	..	..	..	..	1
Housewife	..	1	..	..	..	..	1
Diamond polisher	..	1	..	1	..	..	2
Printers	1	..	1	..	..	..	2
Embroidery workers	2	..	..	..	..	..	2
Glass cutter	..	..	..	..	..	1	1
Turners and Tinsmiths	..	1	..	1	..	..	2
Carpenters	..	..	..	..	..	..	1
Painters	3	10	11	11	6	1	42
Total	12	37	24	26	8	2	109

TABLE II.  
OCCUPATIONS OF WORKERS IN LEAD INDUSTRIES AND CHARACTER OF THE DISEASES, NUMBER OF ATTACKS AND  
THE EFFECT UPON CHILDREN OF WORKERS WHO HAVE HAD LEAD POISONING.

	Acute attacks, workers having:			Chronic cases	Workers having still-born children while working in lead			Workers in lead having children who did not reach 1 year			Workers in lead having children who did not reach 2 years			Total
	1	2	3		1	2	3	1	2	3	1	2	3	
White lead workers.....	7	5	1	10	1	1	1	3	1	1	1	1	1	23
Workers in lead acetate.....	1	1	1	3	1	1	1	1	1	1	1	1	1	23
Lead oxide workers.....	1	1	1	8	1	1	1	1	1	1	1	1	1	3
Casters (solder, tin foil and lead alloy).....	1	1	1	1	1	1	1	1	1	1	1	1	1	10
Embroidery workers.....	1	1	1	1	1	1	1	1	1	1	1	1	1	3
Glass cutter.....	1	1	1	2	1	1	1	2	1	1	1	1	1	3
Dry color worker.....	3	1	1	2	1	1	1	2	1	1	1	1	1	7
Using lead as a hardening agent.....	1	2	1	4	1	1	1	1	1	1	1	1	1	6
Scaling paint, battleships.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ship caulker.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rougewife.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Diamond polisher.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Printers.....	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Plumbers and Tinsmiths.....	1	1	1	1	1	1	1	1	1	1	1	1	1	2
Carpenters.....	10	3	1	28	3	2	1	3	2	1	2	1	1	42
Painters.....	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total.....	28	15	4	62	7	3	1	9	2	1	2	1	1	109



TABLE III.  
OCCUPATIONS OF WORKERS IN LEAD INDUSTRIES AND CHARACTER AND INCIDENTS OF LEAD POISONING.

	Deaths	Paraly- sia, not wrist drop	Wrist drop	Colic	En- ceph- pathic	Arthritis	Ulc- er- ed hand	Eye trouble	In- ci- pient paraly- sis	Trouble with head	Kidney trouble
White lead workers.....	1	4	5	23	.....	.....	.....	.....	6	1	.....
Workers in lead acetate.....	.....	.....	.....	2	.....	.....	.....	.....	1	.....	.....
Lead oxide workers.....	.....	1	2	3	.....	.....	.....	.....	2	1	.....
Casters (soldier, tin foil and lead alloys).....	1	2	5	8	.....	.....	.....	.....	3	.....	.....
Embroidery workers.....	.....	.....	.....	2	.....	.....	.....	.....	1	.....	.....
Glass cutters.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Dry color workers.....	.....	.....	.....	3	.....	.....	.....	.....	.....	.....	.....
Using lead as a hardening agent.....	.....	.....	2	7	.....	.....	.....	.....	2	.....	.....
Sealing plant, battleships.....	.....	1	.....	5	1	1	.....	.....	4	2	.....
Ship casier.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....	.....
Rosewife.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Diamond polisher.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Printers.....	2	.....	1	2	1	.....	.....	1	.....	.....	.....
Plumbers and tinmiths.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....
Carpenters.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....
Painters.....	2	10	5	37	.....	4	.....	.....	12	12	4
Total.....	6	18	20	100	2	5	2	6	34	18	4

TABLE IV.

OCCUPATIONS OF WORKERS IN LEAD INDUSTRIES AND WAGES AT TIME OF FIRST ATTACK OF LEAD POISONING.

	\$8.00- \$9.99	\$10.00- \$11.99	\$12.00- \$13.99	\$14.00- \$15.99	\$16.00- \$17.99	\$18.00- \$19.99	\$20.00 and over	Infor- mation lacking	Total
White lead workers.....	10	4	9	.....	.....	.....	.....	.....	23
Workers in lead acetate.....	1	.....	1	.....	.....	.....	.....	.....	2
Lead oxide workers.....	1	.....	1	.....	.....	.....	.....	.....	3
Casters (soldier, tin foil and lead alloys).....	.....	.....	.....	7	1	1	1	.....	10
Embroidery workers.....	.....	1	.....	.....	.....	.....	.....	.....	2
Glass cutter.....	.....	1	.....	.....	.....	.....	.....	.....	1
Dry color workers.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Using lead as a hardening agent.....	1	2	.....	.....	.....	.....	.....	.....	3
Sealing paint, battleships.....	.....	.....	2	4	.....	.....	1	.....	7
Ship caulker.....	.....	.....	6	.....	.....	.....	.....	.....	6
Housewife.....	.....	.....	.....	.....	.....	.....	.....	1	1
Diamond polisher.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Printers.....	.....	.....	.....	.....	.....	.....	2	.....	2
Plumbers and tinsmiths.....	.....	.....	1	.....	.....	.....	2	.....	3
Carpenters.....	.....	1	.....	.....	.....	.....	.....	1	2
Painters.....	.....	1	2	1	3	8	28	.....	42
Total.....	13	10	23	12	4	9	35	3	110

TABLE V.

OCCUPATIONS OF WORKERS IN LEAD INDUSTRIES AND TOTAL AMOUNT OF WAGES LOST ON ACCOUNT OF LEAD POISONING.

	Less than \$50	\$50-\$99	\$100-\$149	\$150-\$199	\$200-\$499	\$500-\$999	\$1000	Unknown	Total
White lead workers.....	7	8	3	.....	.....	1	.....	4	23
Workers in lead acetate.....	2	.....	.....	.....	.....	.....	.....	.....	2
Lead oxide workers.....	.....	1	1	.....	1	.....	.....	.....	2
Oasters (solder, tin foil and lead alloys).....	1	2	.....	1	.....	.....	1	4	10
Dry color workers.....	1	.....	.....	.....	.....	.....	.....	1	2
Using lead as a hardening agent.....	2	3	1	.....	2	1	.....	.....	7
Sealing paint, battleships.....	4	.....	.....	.....	.....	.....	.....	.....	6
Ship caulker.....	.....	.....	.....	.....	.....	.....	.....	1	1
Housewife.....	.....	.....	.....	.....	.....	.....	.....	1	1
Diamond polishers.....	.....	.....	.....	.....	.....	1	1	1	3
Printers.....	1	1	.....	.....	1	.....	.....	.....	3
Embroidery workers.....	.....	.....	.....	.....	.....	.....	.....	1	1
Glass cutter.....	.....	.....	1	.....	.....	.....	.....	1	2
Plumbers and tin smiths.....	.....	1	1	.....	.....	.....	.....	.....	2
Carpenter.....	.....	.....	3	.....	.....	4	3	5	11
Painters.....	11	5	3	3	8	.....	.....	.....	42
Total.....	29	20	10	4	13	7	7	19	108

TABLE VI.  
OCCUPATIONS OF WORKERS IN LEAD INDUSTRIES AND AMOUNT OF TIME LOST DUE TO LEAD POISONING.

	7 days or less	8 days— 30 days	1 mo.— 3 mos.	4 mos.— 6 mos.	7 mos.— 12 mos.	Information lacking	Total
White lead workers.....	6	1	11	1	2	2	23
Workers in lead acetate.....	1	1	2	2	1	1	8
Lead oxide workers.....	1	3	2	2	1	1	10
Casters (soldier, tinfoil and lead alloys).....	1	2	1	1	1	1	7
Dry color workers.....	1	4	1	1	1	1	10
Using lead as hardening agent.....	2	2	1	1	1	1	8
Sealing paint, battleships.....	1	1	1	1	1	1	6
Ship caulker.....	1	1	1	1	1	1	6
Housewife.....	1	1	1	1	1	1	6
Diamond polisher.....	1	1	1	1	1	1	6
Printers.....	1	1	1	1	1	1	6
Embroidery workers.....	1	1	1	1	1	1	6
Glass cutters.....	1	1	1	1	1	1	6
Plumbers and tinmiths.....	1	1	1	1	1	1	6
Carpenter.....	1	1	1	1	1	1	6
Painters.....	6	6	11	5	8	6	42
Total.....	18	21	32	12	15	11	109

TABLE VII.  
 WORKERS IN LEAD INDUSTRIES CLASSIFIED BY THE LENGTH OF TIME EMPLOYED AND TIME LOST ON ACCOUNT OF LEAD POISONING.

LENGTH OF EMPLOYMENT	7 days	8 days— 30 days	1 mo.— 3 mos.	4 mos.— 6 mos.	7 mos.— 12 mos.	Information lacking	Total
6 months or less.....	4	3	4	1	1	.....	13
7 months—12 months.....	2	1	.....	.....	.....	.....	3
1 year—5 years.....	4	7	13	2	2	.....	28
6 years—10 years.....	2	3	6	2	1	.....	14
11 years—20 years.....	3	2	2	5	4	.....	16
21 years and over.....	3	5	7	2	7	.....	24
Total.....	18	21	32	12	15	11	109

TABLE VIII.  
OCCUPATIONS OF WORKERS IN LEAD INDUSTRIES AND LENGTH OF TIME EMPLOYED IN A LEAD INDUSTRY.

	6 months or less	7 months— 12 months	1 year— 5 years	6 years— 10 years	11 years— 20 years	21 years and over	Information lacking	Total
White lead workers.....	5	2	9	2	2	1	2	33
Workers in lead acetate.....	1	1	1	1	1	1	1	2
Lead oxide workers.....	1	1	2	1	2	4	1	3
Castors (gold, tin, and lead alloys).....	1	1	1	1	1	1	1	10
Dry color workers.....	3	1	2	1	1	1	1	3
Lead as hardening agent.....	1	1	3	1	1	1	1	3
Paint sealing, battleships.....	1	1	5	1	1	1	1	7
Ship caulker.....	1	1	1	1	1	1	1	6
Housewife.....	1	1	1	1	1	1	1	1
Diamond polishers.....	1	1	1	1	1	1	1	2
Printer.....	1	1	1	1	1	1	1	3
Embroidery workers.....	1	1	1	1	1	1	1	2
Glass cutter.....	1	1	1	1	1	1	1	1
Plumbers and tinmiths.....	1	1	1	1	1	1	1	2
Carpenter.....	1	1	1	1	1	1	1	1
Painter.....	1	1	2	7	9	16	6	43
Total.....	13	3	28	14	16	24	11	109

TABLE IX.  
OCCUPATIONS OF WORKERS IN LEAD INDUSTRIES AND HYGIENIC PRECAUTIONS TAKEN BY THEM.

	DID YOU EAT IN WORKROOM?			Total	DID YOU WASH BEFORE EATING?				Total
	Yes	No	Informa- tion lacking		Yes		No	Informa- tion lacking	
					Hot water	Cold water			
White lead workers.....	11	8	4	23	7	12	1	3	23
Workers in lead acetate.....	2	.....	.....	2	1	1	.....	.....	3
Lead oxide workers.....	3	.....	.....	3	.....	3	.....	.....	3
Casters (solder, tinfoil and lead alloys).....	5	3	2	10	6	1	1	2	10
Dry color workers.....	3	.....	.....	3	2	.....	.....	.....	3
Lead as hardening agent.....	2	5	.....	7	.....	.....	.....	.....	7
Sealing paint, battleships.....	6	.....	.....	6	.....	1	5	.....	6
Ship caulker.....	.....	.....	1	1	.....	.....	.....	1	1
Housewife.....	.....	.....	1	1	.....	.....	.....	1	1
Diamond polisher.....	2	.....	.....	2	.....	1	.....	.....	2
Printer.....	2	1	.....	3	2	1	1	.....	3
Embroidery workers.....	1	.....	.....	1	.....	2	.....	.....	2
Glass cutter.....	.....	.....	1	1	.....	.....	.....	1	1
Plumbers and tinmiths.....	.....	2	.....	2	.....	.....	.....	.....	2
Carpenter.....	.....	1	.....	1	.....	.....	.....	.....	1
Painter.....	25	14	3	42	13	23	4	3	42
Total.....	62	35	12	109	31	45	22	11	109

TABLE X.

OCCUPATIONS OF WORKERS IN LEAD INDUSTRIES AND ANALYSIS OF INSTRUCTIONS GIVEN THEM BY THEIR EMPLOYERS CONCERNING THE DANGERS AND PREVENTION OF LEAD POISONING.

	WERE INSTRUCTIONS GIVEN YOU AS TO DANGERS OF THE WORK AND HOW TO SAFEGUARD YOURSELF?				WERE INSTRUCTIONS POSTED IN THE WORK PLACE?			
	Yes	No	Information lacking	Total	Yes	No	Information lacking	Total
White lead workers.....	7	15	1	23	7	14	2	23
Workers in lead acetate.....	1	1	.....	2	1	1	.....	2
Lead oxide workers.....	2	1	.....	3	1	2	.....	3
Casters (solder, tin foil and lead alloys).....	2	5	3	10	.....	7	3	10
Embroidery workers.....	.....	2	.....	2	.....	2	.....	2
Glass cutter.....	.....	.....	1	1	.....	.....	1	1
Dry color workers.....	1	2	.....	3	1	2	.....	3
Using lead as a hardening agent.....	.....	7	.....	7	.....	7	.....	7
Scaling paint, battleships.....	1	5	.....	6	.....	6	.....	6
Ship caulker.....	.....	.....	1	1	.....	.....	1	1
Housewife.....	.....	.....	.....	1	.....	.....	1	1
Diamond polisher.....	.....	2	.....	2	.....	2	.....	2
Printer.....	.....	1	2	3	.....	1	2	3
Plumber and tin smith.....	.....	.....	2	2	.....	.....	1	1
Carpenter.....	.....	1	1	2	.....	.....	.....	2
Painter.....	3	32	7	42	.....	32	10	42
Total.....	17	73	19	109	10	76	23	109



TABLE XI.  
OCCUPATIONS OF WORKERS IN LEAD INDUSTRIES AND THE USE OF ALCOHOLIC DRINKS.

	QUANTITY				Total	FORM					
	Exces- sive	Mod- erate	None	Un- known		Beer	Whisky	Other	None	Un- known	Total
White lead workers.....	1	15	4	3	23	14	6	.....	4	3	27
Workers in lead acetate.....	.....	2	.....	.....	2	2	1	.....	.....	.....	3
Lead oxide workers.....	.....	3	.....	.....	3	3	1	.....	.....	.....	4
Casters (solder, tin foil and lead alloys).....	3	6	1	.....	10	5	2	.....	2	3	12
Embroidery workers.....	.....	.....	2	1	3	.....	.....	.....	2	1	3
Glass cutler.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1
Dry color workers.....	.....	2	1	.....	3	2	1	1	.....	.....	4
Using lead as a hardening agent.....	1	5	1	.....	7	6	3	.....	1	.....	10
Sealing paint, battleships.....	.....	4	2	.....	6	4	4	.....	2	.....	10
Ship caulker.....	.....	.....	.....	1	1	.....	.....	.....	.....	1	1
Housewife.....	.....	.....	1	.....	1	.....	.....	.....	1	.....	1
Diamond polisher.....	.....	.....	2	.....	2	.....	.....	.....	2	.....	2
Printer.....	.....	1	1	.....	2	.....	.....	.....	.....	.....	2
Plumbers and tinmiths.....	1	.....	1	1	3	.....	1	.....	.....	.....	4
Carpenter.....	.....	1	.....	.....	1	.....	.....	1	.....	1	2
Painter.....	.....	20	15	1	42	27	9	7	5	5	53
Total.....	6	65	31	7	109	67	28	9	20	14	138

TABLE XII.

OCCUPATIONS	FORM IN WHICH TOBACCO IS USED						QUANTITY OF TOBACCO USED					
	Pipe	Cigar	Cigar-ette	Chew	None	No information	Total	Excess	Moder-ate	None	No information	Total
White lead workers.....	3	1	7	2	8	4	25	2	10	8	3	23
Workers in lead acetate.....	.....	.....	1	.....	1	.....	2	.....	1	1	.....	2
Lead oxide workers.....	.....	.....	1	.....	2	.....	3	.....	1	2	.....	3
Casters (solder, tinfol and lead alloys).....	6	4	1	3	.....	.....	14	5	5	.....	.....	10
Dry color worker.....	1	.....	.....	.....	2	.....	3	.....	1	.....	.....	3
Using lead as a hardening agent.....	2	2	3	2	.....	.....	9	3	4	.....	.....	7
Sealing paint, battleships.....	4	.....	2	4	1	.....	11	2	3	1	.....	6
Ship caulker.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	1	1
Housewife.....	.....	.....	.....	.....	1	.....	1	.....	.....	1	.....	1
Diamond polisher.....	1	2	.....	.....	.....	.....	3	.....	2	.....	.....	3
Printers.....	2	2	1	3	.....	.....	8	2	1	.....	.....	3
Embroidery workers.....	.....	.....	.....	.....	2	.....	2	.....	.....	2	.....	2
Glass cutter.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	1	1
Plumbers and tinmiths.....	1	.....	1	.....	.....	1	3	.....	1	.....	.....	2
Carpenter.....	.....	.....	.....	.....	.....	1	1	.....	1	.....	.....	1
Painter.....	6	8	18	2	6	5	45	8	25	6	3	42
Total.....	26	19	35	16	23	13	162	22	55	23	9	109

TABLE XIII.  
OCCUPATIONS OF WORKERS IN LEAD INDUSTRIES AND PERSONAL HABITS.

	DID YOU CHANGE CLOTHING? AT					DID YOU WEAR?				
	Factory	Home	Neither	Unknown	Total	Mustache	Beard	Neither	Unknown	Total
White lead workers.....	15	1	3	4	23	14	.....	7	2	23
Workers in lead acetate.....	2	.....	.....	.....	2	.....	.....	1	.....	2
Lead oxide workers.....	2	1	.....	.....	3	2	.....	2	.....	3
Casters (copper and lead alloys).....	6	1	1	2	10	7	.....	3	1	10
Dry color workers.....	3	.....	.....	.....	3	.....	.....	3	.....	3
Using lead as a hardening agent.....	4	3	1	.....	8	3	.....	4	.....	8
Sealing paint, battenships.....	6	6	.....	.....	12	4	.....	2	.....	7
Ship caulker.....	.....	.....	.....	1	1	.....	.....	.....	1	1
Housewife.....	.....	.....	.....	1	1	.....	.....	.....	.....	1
Diamond polisher.....	2	.....	.....	.....	2	1	.....	1	.....	2
Printers.....	2	1	.....	.....	3	1	1	.....	.....	3
Embroidery workers.....	1	.....	1	.....	2	.....	.....	2	.....	2
Class cutter.....	.....	.....	.....	1	1	.....	.....	.....	1	1
Plumbers and tinsmiths.....	.....	1	.....	1	2	1	.....	.....	.....	2
Carpenter.....	27	.....	2	11	42	1	.....	11	2	42
Painters.....	.....	2	.....	.....	2	29	.....	.....	.....	2
Total.....	70	16	8	22	116	63	1	37	8	109

## CHAPTER VI

### RECOMMENDATIONS.

This investigation, hasty and incomplete as it is, has demonstrated certain facts. Facts which a further investigation can fortify, but cannot disprove.

The amount of lead poisoning is actually and relatively large. While in the course of this investigation only 376 cases have been found, the limited sources of our information make it almost certain that at least twice that number of cases exist in the city of New York. The cases which have been carefully and fully followed up and about which detailed information has been secured, prove conclusively that lead poisoning is a serious menace with often fatal consequences to the workers. These workers have been found to be employed in a great variety of industries and using lead in many forms. Some of these workers were engaged in the manufacture of carbonate and oxide of lead, some in dry colors and paints, some in smelting, refining and casting of lead and lead alloys, and more than any other one group, in the painting trade. The methods of infection differ in the different industries. In almost all the lack of proper cleanliness leading to infection by the conveying of lead into the system through the mouth was the most important. In the manufacture of lead powders the inhalation of dust was also important. In the smelting, refining and casting of lead the writer believes that the oxide which is continually forming on the molten lead and which must be constantly forming in the immediate vicinity is the chief source of infection. In painting, the inhalation of the lead fumes, the direct contact with lead in paints and the very dangerous process of sandpapering are the principal direct causes. An attempt must be made to guard against these sources of danger.

Another striking discovery of this investigation is the almost entire lack of adequate precautions on the part of the employers. It might be thought that employers would find it to their own interests to safeguard the workers in the hope of getting more steady

and a better quality of work. But this is not true. There are all grades of indifference,—from the employer who told the Commission with gusto and pride that he had provided buckets which the men could fill with cold water in which to wash, but which the men said they actually furnished themselves, to the employer who really has taken considerable precaution, but who does not enforce the measures which he knows are best. Employers should, therefore, be informed of the dangerous character of their businesses and be brought sharply to the realization of the fact that they are trespassing on the rights of the community when they neglect the health of their employees.

Another fact which this investigation has revealed is the inefficiency of the methods of protection taken by employers. One firm has installed a doctor who tells the commission on the stand that he is not concerned with the processes of manufacture, and in fact does not know about them, further, that he makes no effort to seek out men who may be ill or that he makes no effort to suggest improvements. Close inspection revealed the fact that such measures, although costing as much as efficient protection, are of very small value. Another firm claims that it discharges men who show signs of being leaded. Yet one man suffering from severe lead poisoning,—so severe as to be painfully evident,—had actually been sent for twice in the week preceding the visit of the investigator to him. In the numerous smaller establishments almost no care is taken of the men, and what is taken is of a very trivial nature.

No doubt one of the greatest preventatives of lead poisoning would be the knowledge and realization on the part of the workers in lead, that the occupation is dangerous and that personal habits have much to do with prevention. One man, for example, was found on Sunday noon eating his dinner with hands still besmeared with the pigments in which he had been working on Saturday. The painters are probably the worst offenders in this regard, and with them personal cleanliness and methods of prevention which they can themselves take, are of great avail. One of the things which must be done, then, in stamping out lead poisoning is to instruct the rank and file of workers in lead as to the danger of the poison in which they are working and the methods of prevention.

In view of these facts the following recommendations are made. They are minimum in the sense that they provide only for a minimum number of measures which ought to be taken to insure a reasonable degree of safety in the lead industries. Other recommendations of a more minute and detailed character can be made only after a more extended and complete investigation. The recommendations offered herewith indicate methods which have been successfully followed and one or another of which have actually been put into practice voluntarily by firms in this State or in other states. They mark no new departure in legislation, except, perhaps, to point out and segregate for special legislation some industries which are of an especially dangerous character; very much as certain dangerous or even unpleasant industries are subject to special laws regarding fire hazards, locations, character of buildings, etc., etc. These recommendations in the main have to do with the extending and broadening the powers now vested in certain state officials, and also the compulsory use of some powers which are probably already vested in those officers. They also contemplate greater stringency in providing the minimum hygienic and sanitary conditions in these dangerous trades.

*Part I. Industries in which lead is used:*

1. Each and every industry, factory, mill or shop in which lead in any form is used shall be licensed and shall be permitted to carry on those processes in which lead is used only under the conditions specified by the Commissioner of Labor.

2. Each and every worker who comes in contact with, or in dangerous proximity to lead in any form shall be subjected to a thorough physical examination each month. This examination shall be conducted by the Medical Inspector of Factories of the State of New York.

3. Each and every worker in any industry in which lead in any form is used, who shows any evidence of being affected by lead poisoning, shall be at once removed from immediate contact with lead, and if possible from the industry. Such persons shall not take employment in the same or in any other industry in which lead in any form is used, without the specific and written consent of the Medical Inspector of Factories.

4. The Medical Inspector of Factories shall be empowered to make regular monthly examinations of all workers in industries in which lead in any form is used, and he shall also be empowered to make such examinations of workers at other times as he shall see fit.

5. The Medical Inspector of Factories shall be provided with a staff of assistants adequate for the performance of these duties.

6. One chemist shall be attached to the staff of the Medical Inspector of Factories. It shall be the duty of this chemist to determine by the chemical analysis of air specimens, the presence and amount of lead in the air in buildings and factories in which lead in any form is used, and to make such analyses of materials, products, human excreta, etc., as shall be deemed necessary by the Medical Inspector of Factories.

7. A permanent record of the workers in industries in which lead in any form is used shall be kept by the Medical Inspector of Factories. These records shall contain, at least, the name and address of each worker, length of time employed, exact process which the worker performed (in detail), a complete statement of the physical examination, which shall include information concerning,— examination of gums; teeth; heart,— size, murmurs, blood pressure; arterio-sclerosis; lungs; digestion; constipation; nervous system,— neuritis, cramps, palsy; hands,— eczema, fissures, ulcers; blood,— hemoglobin, red cells, white cells, basophiles; urine,— albumen, casts, specific gravity, lead.

8. In each and every industry, factory, mill and shop where lead dust in any form,— lead carbonate, lead litharge, oxide of lead, or any other lead dust — is present, or where oxide of lead is liable to form on the surface of molten lead, there shall be a localized system of ventilation in the shape of a powerful exhaust. This exhaust, which shall be kept running during working hours, shall be powerful enough to remove from the immediate locality all traces of the dust. The effectiveness of the dust removal system shall be determined by scientific experiment and not by observation.

9. Each and every room in each and every industry, factory, mill, or shop in which any process involving the use of lead in any form, is carried on, shall be well lighted and ventilated with a continual supply of fresh air.

10. Each and every industry, factory, mill or shop in which lead in any form is used shall provide for the workers coming in contact with, or in dangerous proximity to lead in any form, the following sanitary and hygienic facilities: (a) one wash basin, with one spigot each of hot and cold water, for every five employees; (b) one shower bath, with hot and cold water, for every ten employees, (c) one clean towel per day for each employee; (d) soap for each employee; (e) one suit of clean overalls per week for each employee; (f) a lunch room which the Commissioner of Labor shall deem to be of sufficient capacity; (g) a locker, suitable for keeping of clothing, for each employee.

11. Each and every employee in any factory in which lead dust may form, or where oxide of lead is apt to form on molten lead, shall be furnished with suitable protective devices and safeguards, such as: respirator, gloves, goggles, overalls and other protective devices as may be deemed necessary and proper by the Medical Inspector of Factories.

12. No employee in any factory, mill or shop in which lead in any form is used shall be allowed or permitted to eat in any workroom of such factory, mill or shop.

13. Not less than one hour shall be allowed for lunch in any factory, mill, or shop in which lead in any form is used.

14. No beer, tobacco or edibles in any form shall be permitted to be brought into any workroom where lead in any form is used.

15. Each and every employee shall be required to wash thoroughly in warm water before each meal and before leaving the factory. Ten minutes shall be allowed on the employer's time for this purpose. Each and every employee shall be required to take one bath per week, which shall also be allowed on the employer's



time. A register of these baths shall be kept for the inspection of the Medical Inspector of Factories.

16. Each and every factory, mill or shop in which lead in any form is used, shall supply, free of charge to its employees, medical advice and service, approved by the Medical Inspector of Factories. Such advice shall be given on the premises of the factory not less than one hour each week, per 25 employees. All drugs, prescriptions and other medical appurtenances required for the treatment of employees suffering from lead poisoning, shall be supplied free of charge by employers.

17. The superintendent of any factory, mill or shop in which lead in any form is used, shall instruct his employees, or shall cause his employees to be instructed, as to the dangers of lead and as to the proper precautions which must be taken.

18. Complete instructions as to the dangers of work in lead, and how to guard against them, shall be published by the Department of Labor, and shall be posted in every mill or shop where lead in any form is used.

19. The Commissioner of Labor shall carry on a campaign of education among the workers in industries in which lead in any form is used, by means of circulars printed in different languages, and by means of talks and lectures before groups of workers in the factories and trade union meetings. The workers shall be instructed as to the dangers of the work, methods of safeguarding themselves, and of simple remedies to be applied in case of illness.

#### *Part II. The Painting Trade:*

1. All buildings in process of construction, or undergoing repairs, where five or more workers are employed at any one time, shall be subject to the jurisdiction of the Department of Labor, and shall be inspected by the Department of Labor.

2. No paint or varnish shall be removed from any surface in any building, by any dry process which gives rise to dust.

3. Not less than one hour shall be allowed for lunch.

4. In every building in course of construction, a room shall be provided, or shall be specifically set aside for a lunch room, and shall be equipped with serviceable tables and chairs. No food or drink shall be allowed or permitted in any building in course of construction except in the room provided for eating purposes.

5. Hot and cold water shall be provided for the use of workers on every third floor. Each employee shall be provided with one clean towel per day, with soap and one clean suit of overalls per week.

6. Complete instructions as to the dangers of work in lead and how to guard against them, shall be published by the Department of Labor, and shall be posted in the meeting rooms of all trade-unions in the painting trades, in buildings in course of construction and in the shops and offices of the boss painters.

7. Employers and boss painters shall be required to instruct, personally, each and every employee concerning the dangers of lead poisoning, and how to guard against them.

8. Each and every painter or person working in paint shall be subjected to a thorough physical examination each month. This examination shall be conducted by the Medical Inspector of Factories of the State of New York.

9. Each and every painter or person working in paint who shows any evidence of being affected by lead poisoning, shall be at once removed from immediate contact with paint. Such person shall not take employment in the same or any other industry in which lead in any form is used, without the specific written consent of the Medical Inspector of Factories.

10. The Medical Inspector of Factories shall be empowered to make regular monthly examinations of all painters and workers in paints, and he shall be empowered to make such examinations of workers at other times as he shall see fit.

11. A permanent record of painters and workers in paints shall be kept by the Medical Inspector of Factories. These records shall contain, at least, the name and address of each worker, length of time employed, exact process which the worker performed (in detail), a complete statement of physical examination, which shall include information concerning,—examination of gums; teeth; heart,—size, murmurs, blood pressure; arterio-sclerosis; lungs; digestion; constipation; nervous system,—neuritis, cramps, palsy; hands,—eczema, fissures, ulcers; blood,—hemoglobin, red cells, white cells, basophiles; urine,—albumen, casts, specific gravity, lead.

12. No beer, tobacco or other edibles in any form shall be permitted to be brought into any room in any building in course of construction in which paint is being used.

13. Each and every painter or person working in paint shall be required to wash thoroughly in warm water before each meal, and before leaving the building. Ten minutes shall be allowed on the employer's time for this purpose. Each and every employee shall be required to take one bath per week, which shall also be allowed on the employer's time. A register of these baths shall be kept for the inspection of the Medical Inspector of Factories.

14. Each and every person employing painters or persons using paint in any form shall supply free of charge to his employees, medical advice and service, approved by the Medical Inspector of Factories. Such advice shall be given on the premises of the building, not less than one hour per week per 25 employees. All drugs, prescriptions and other medical appurtenances required for the treatment of employees suffering from lead poisoning, shall be supplied free of charge by the employer.

In view of the comparatively narrow limits of this investigation it is too much to expect that these recommendations will have great weight. There is, however, one recommendation which we wish to urge, and for the support of which we believe that we have ample evidence. We believe that the evidence which we have presented proves conclusively that we have here a serious and diffi-

cult problem. We believe that the problem is so serious that it should not be settled offhand, or on the evidence here presented. We believe that a careful, painstaking and thoroughly scientific investigation should be made,—an investigation which should include the inspection of factories, the determination of the poisonous character of materials used, determination of air contents, the physical examination of employees, the morbidity and employment records of employees, a careful and detailed study of all cases of lead poisoning to be obtained from the records of hospitals, dispensaries, trade-unions, fraternal insurance societies and any other sources.

Such an inquiry should be constituted with specific authority,—to subpoena witnesses, records, payrolls and other information deemed necessary to accomplish a thorough inquiry; to inspect factories and workshops and to make any photographs of employees or processes which may be deemed necessary in order to clearly set forth conditions; to consult the medical records of lead poisoning in the possession of hospitals, dispensaries, fraternal, commercial and industrial insurance companies, and physicians; to make physical examination of workers when necessary.

Doubtless other industrial poisons also deserve investigation, for example, arsenical poisoning. An investigation of all industrial poisons could be accomplished most easily and economically if carried on in conjunction with an investigation of lead poisoning.

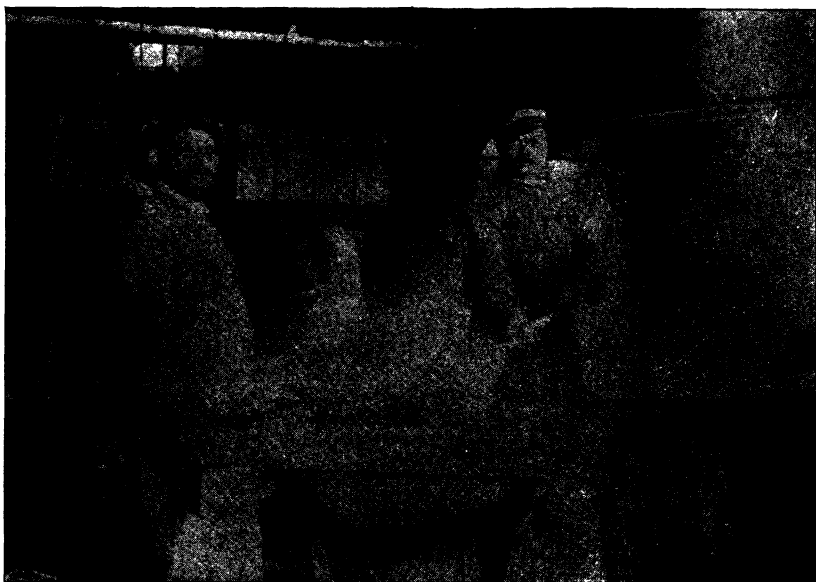
## APPENDIX A.

### THE MANUFACTURE OF PARIS GREEN.

In connection with the manufacturing of dry colors several plants also manufactured paris green. Paris green contains a large percentage of arsenic and workers in paris green are likely to be subject to arsenical poisoning. As already noted in the descriptions of the dry color plants, the conditions in these plants are generally very bad. What has been said there may be emphasized in connection with the manufacture of paris green.

The Illinois Commission on Occupation Diseases has this to say of paris green. "Arsenite of copper, or paris green . . . is



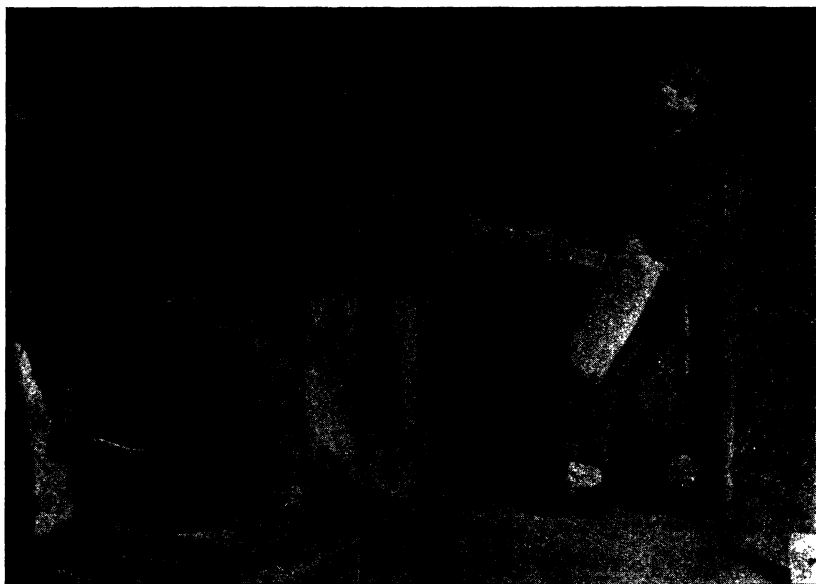


No. 64.—FACTORY A — PARIS GREEN. Removing paris green from vats. The worker enters the vats and shovels the paris green into a tray. Vapors can be seen rising about the workmen.

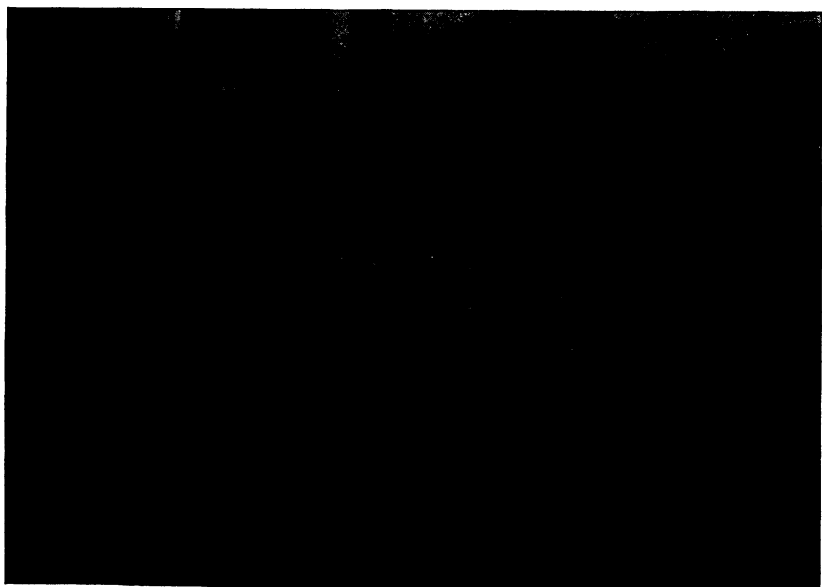


No. 65.—FACTORY A — PARIS GREEN. Carrying paris green into the drying room.





No. 66.—FACTORY A — PARIS GREEN. Detail of 65.



No. 67.—FACTORY A — PARIS GREEN. Putting paris green into a bolter.





a very light and fluffy powder, extremely hard to control. If it settles on the skin and becomes moistened by the perspiration, ulcers are apt to result. If it is breathed into the mucous membrane of the mouth and nose, still severer ulceration takes place. Cases have occurred of ulceration of the feet when the boots have become soaked with water holding paris green. The internal effects of paris green poisoning are shown in intestinal and nervous disturbances."

Four factories manufacturing paris green were inspected. In two of these the conditions were good. In one, almost every possible precaution had been taken. In the other two plants, the conditions were almost unbelievable. Very little protection against the paris green powder, almost no washing facilities, no place to eat lunch, eating in the workroom permitted, primitive sanitary conditions, lack of instructions, or even lack of recognition of danger on the part of the employers were found to exist.

Evidences of poisoning were difficult to trace because the workers, almost universally, could not speak English enough to give intelligible answers to questions. One negro employed in one of the bad factories, in answer to the question, "Have any of the men here been poisoned by paris green?" made the significant answer, "You bet, every mother's son of us has had it." In the other plant where conditions were especially bad, the inspector was hampered in every way, and was refused permission to make photographs. This refusal is eloquent of the conditions that exist there in view of the descriptions given below.

#### FACTORY A.

##### *I. Manufacture of Paris Green:*

This factory is housed in a collection of old buildings, but has really done rather remarkable work in safeguarding the workers. There are about 20 men employed in the making of paris green. They are Slavs, Poles, Lithuanians and Russians.

The first process of the manufacturing is carried on on the third floor of the central building of the group, and is lighted from two sides. The first solution, a mixture of copper sulphate

and acetic acid, is made in large vats and is continually stirred by the workers. Vaporous gases rise constantly from the vats over which the men work. Water is added to the solution in large quantities, and the heavier substances are allowed to settle gradually to the bottom of the vats. The water is then drained off, leaving a residue of moist green pulp. One of the workers then gets into the vats and shovels the wet paris green (see photo No. 64), into a hand conveyor, the bottom of which is cloth. This conveyor is then placed on a rack and much of the water which remains is gradually drained off. The workers who shovel out the vats are exposed, of course, to the most dangerous vapors which rise from the moist paris green.

After as much of the water has been drained off as possible, the paris green is dumped on a platform at one end of the room. It is then shoveled onto small trays (see photo No. 65) and is carried by the workers into the drying room (see photo No. 66). Here a comparatively high temperature is generated and the last bit of moisture is removed from the paris green.

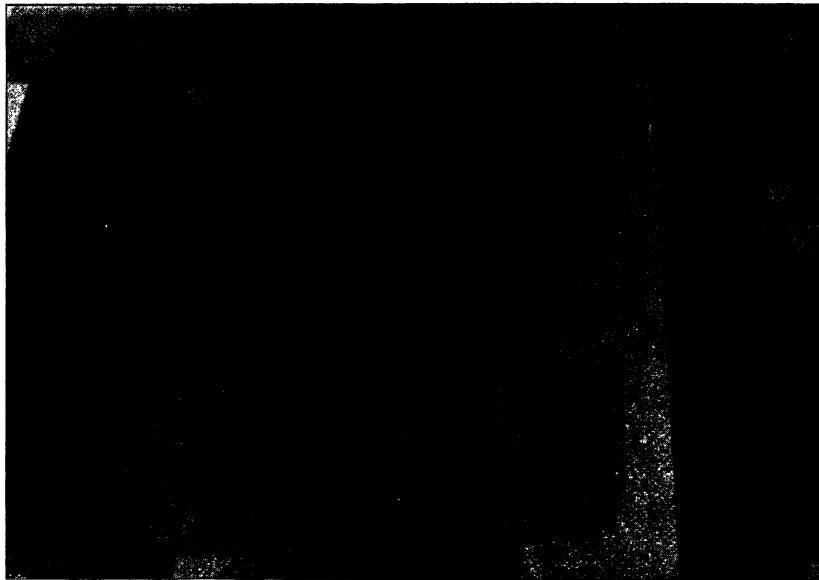
After the drying room process is completed, the paris green is caked and rather hard, is then put through a machine called the bolter. The process consists of forcing the powder through a very fine screen by means of brushes. This is usually one of the dustiest and, therefore, one of the most dangerous jobs in the whole process of making paris green. In this factory, the process is especially well guarded and the workers are protected as much as possible from disease.

In many establishments where paris green is made, the material after coming from the drying room, is dumped into the bolter and the machine and worker are unprotected, and the dust is thick throughout the room. (See photo No. 76.) In this factory, however, the bolter as well as the method of putting the paris green into it, are thoroughly and completely enclosed, so that no dust escapes from the bolting operations. This is accomplished as follows: the bolting machinery is entirely outside of the room in which the paris green is made (see photo No. 68). The opening between the two is merely a small window into which the worker thrusts a tray full of the dry paris green. He does





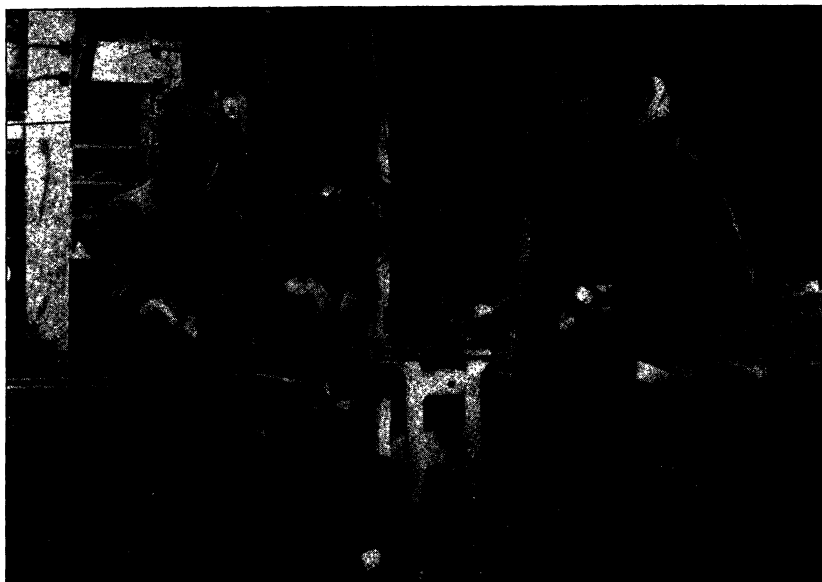
No. 69.—FACTORY A — PARIS GREEN. Packing paris green in barrels.



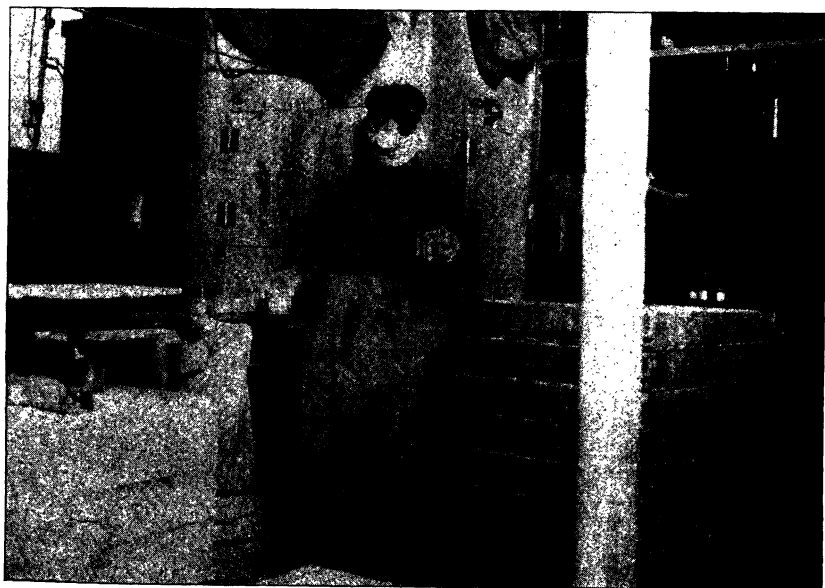
No. 68.—FACTORY A — PARIS GREEN. Paris green bolter.  
Exterior view of bolter as shown in 67.







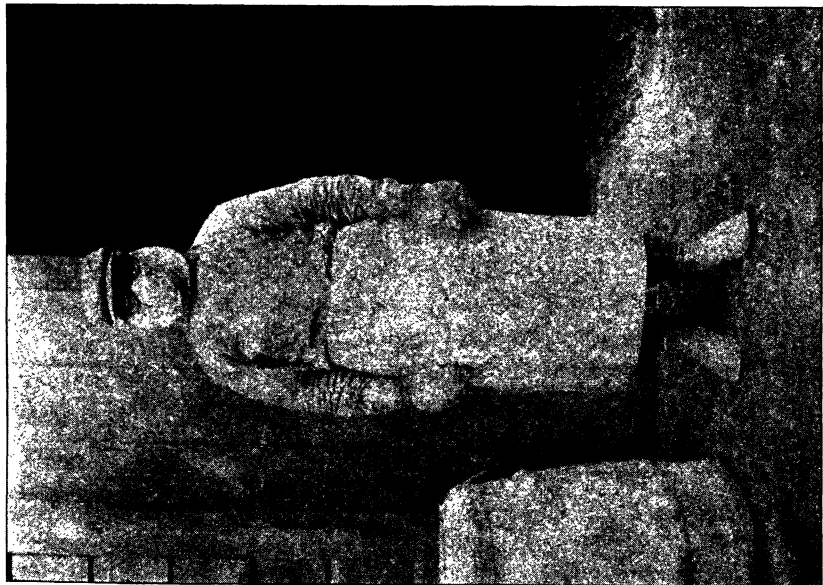
No. 70.—FACTORY A — PARIS GREEN. Automatic packing machines, for filling small packages with paris green.



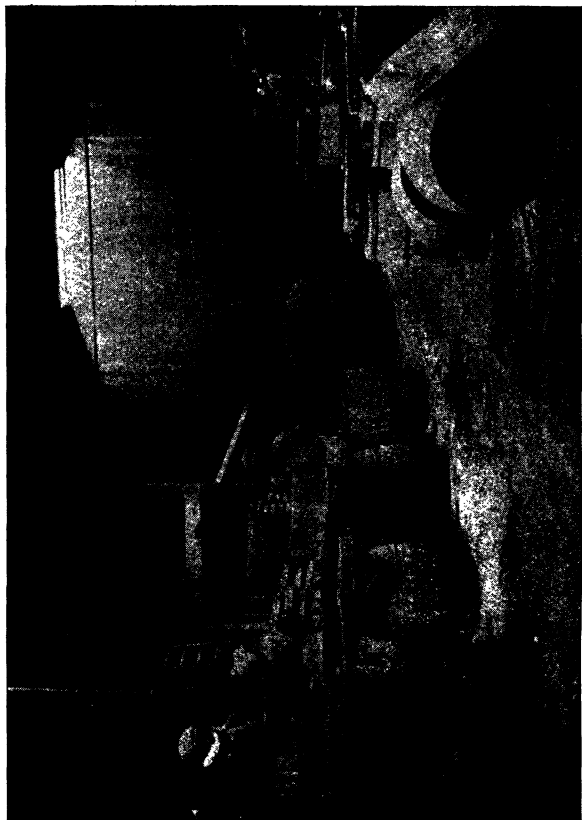
No. 71.—FACTORY A — PARIS GREEN. Another view of automatic packer shown in No. 70.







73.—FACTORY A — PARIS GREEN. Worker, showing protection.



No. 72.—FACTORY A — PARIS GREEN. Packing department.







this by means of a little iron hook, and hence not even his hands have to enter the bolting room. (See photo No. 67.) The tray is then turned over by means of a handle, still outside the bolting room, and the worker pulls it out with his iron hook. The paris green then goes through the bolting machinery and down into the packing room without human interference.

The packing of paris green into barrels is done by machinery, and what employers elsewhere have told the inspector is not a practical method is here working regularly. (See photo No. 69.) The only possible occasion when dust can arise is when the barrel is sealed up, but as this is done by sealing up a very small bung hole, the danger is not great. All the paris green manufactured here is first packed in barrels and if it is later desired to pack it in small cans or boxes, it is removed from the barrels.

The packing department is one of great interest. Here again, this firm has succeeded in doing something that other manufacturers have declared impossible, namely, packing paris green in small cans by machinery. (See photos No. 70 and 71.) The workers here put the empty cans into the machine and others put the filled cans on trays ready to be conveyed to men who seal on the tops and pack into boxes. (See photo No. 72.) What is ordinarily a very dusty and dangerous job and a job done in other factories entirely by hand, is here done entirely by machinery.

## *II. Provisions for Hygiene:*

Much has been done here for the health and safety of the men besides providing respirators, goggles and complete suits of clothing for the workers (see photo No. 73); much has been done in improving the physical conditions of the plant. In the arrangement of the processes themselves as already described, in the elimination of the human element from the bolter and the mechanical filling machinery, great advances over other firms have been made. A lunch room, lavatory and wash room of considerable size have been installed. One of the most noticeable features in the entire plant was the air of quiet ease in the packing department. Paris green is a very fine, light powder, and

flies about very easily. Therefore, if the work is done under strain and done in haste, more or less of the dust will get out and into the air. However, here the work is carefully and quietly done, and there was an almost entire absence of dust.

### *III. Suggestions for Improvement:*

Instructions should be given to the men as to how to keep clean, and as to how to protect themselves from the poisons. This should be done by means of personal instruction. Although a lunch room is provided, it is little used. Why? Because it is not kept clean and the men will never, nor can they be expected to keep it clean themselves. Hot coffee or milk might be served here, which would aid in making the place popular. The washing and bathing facilities are still insufficient, and lockers should be provided.

### FACTORY B.

The paris green department.—The paris green process begins with a solution of copper sulphate and acetic acid in large vats which are set high above the floor in a large, well ventilated room. Above the vats there are hoods which carry off the fumes and the steam. These tanks are drained into another set of vats where the solution is washed and allowed to settle and the water is drained off, leaving a wet mudlike substance. This paris green is then put on trays and removed to the drying room. Here it is thoroughly dried and all the moisture is removed. The process of bolting, or sifting, is carried on in a tightly enclosed box. This process consists of forcing the paris green powder through a very fine screen. A special room is set aside for it, which is tightly enclosed and dust-proof. Almost all the machinery here is enclosed. The paris green is conveyed automatically from the bolting machine to a mixer which is placed on a little balcony. From here the paris green powder runs into the filling machine and is put into barrels and boxes. (See photo No. 74.) The operation is an extremely dusty one, and after a few minutes in the room the inspector was covered with a fine film of paris green. The worker who has charge of this part



No. 74.— FACTORY B — PARIS GREEN. Filling a barrel with paris green.

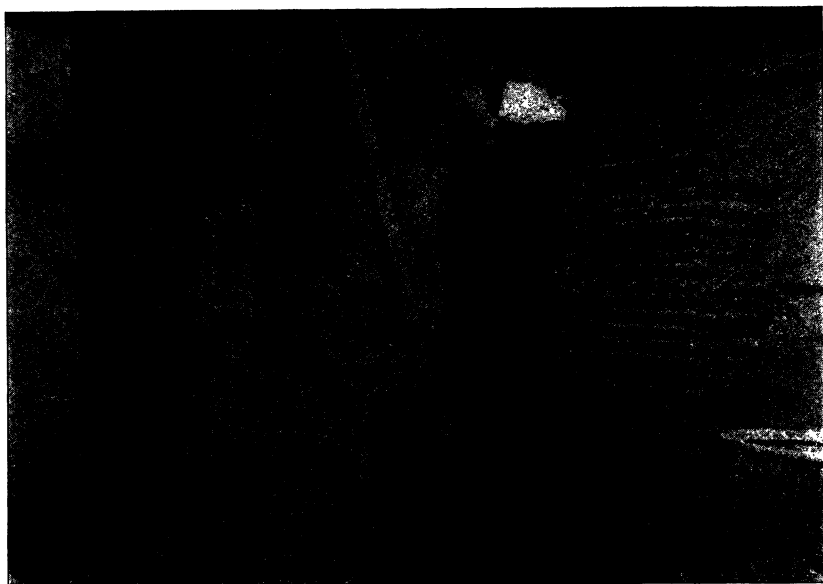


No. 75.— FACTORY C — PARIS GREEN. Locker room and shower, exceedingly dirty and ill-kept.



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No. 76.— FACTORY C — PARIS GREEN. Putting paris green into the bolter.





of the work is provided with a suit of overalls, with linen cloths to tie about his ankles, wrists, head and throat, and also with goggles and respirator. He, however, prefers not to use the respirator, but wears a large piece of linen cloth tied about his nose and mouth, in which is bunched some clean cotton waste.

In spite of these protections, which are evidently well done, the worker admitted that in the summer time especially, he was troubled with arsenical poisoning. But he has worked at this job for some time and has not experienced any very serious results.

#### FACTORY C.

This factory, an old three-story brick building, employs about forty men when running at full capacity; at the time of inspection, about twenty-five men were employed. Workers, who are unskilled, are Italians, Poles, Russians, Germans and a few Negroes. The building is poorly lighted and ventilated. Some of the windows, which were few, were unopened and were covered with deposits of dust, dirt and cobwebs.

The paris green department.—In the paris green department, the solution of copper sulphate is run into large vats where it is boiled for a considerable period. The room in which this is done is very damp, low and poorly ventilated. The solution of paris green, to which water is added, is run into other vats where it settles and the water is drained off. It is then partially dried, put on trays which are piled one above the other and taken into drying rooms. (See photo No. 76.) The paris green when it comes from the drying ovens is a heavy caked powder which must be ground or "bolted," as the term is used. This process consists of the forcing of the paris green through fine screens by means of revolving brushes. The worker, but slightly protected, dumps the trays of paris green into the bolter, from which clouds of dust rise. (See photo No. 76.) Barrels and small packages are then filled. At this factory, there was no filling going on at the time of the inspection. In the room, however, where this work is ordinarily done, the walls and projections were covered with a thick film of paris green.

Another process in operation at the time of inspection was a very dangerous one. The trays on which the paris green is put for drying purposes are covered with heavy paper. This paper was being removed from the trays, and one of the workers was shaking it into a barrel. The dust was very thick in this department and although the worker was protected by a bandana handkerchief, there must have been some effects, although the worker disclaimed any poisoning.

Hygienic conditions.—The conditions in this plant were bad (see photo No. 75), and as one man remarked on being questioned for symptoms of arsenical poisoning, "Yes, every mother's son of us has had it." While this may not be quite accurate, all the men standing about (the superintendent was not in sight) had been affected with rash about the neck and waistline, particularly in the summer time.

The sanitary and hygienic facilities were primitive in the extreme. A dressing room with a shower in the center of the room, was dirty and unventilated. Dirty clothing hung about the walls or was stuffed into open wooden lockers. Washing facilities consisted of a sink provided with cold water. The men eat their lunches anywhere they wish, and are given no instructions. In fact, the superintendent seemed unaware of the danger.

#### FACTORY D.

There are from 75 to 80 men employed in this factory and the hours are ten per day, nine on Saturday, 59 per week.

1. In the manufacture of paris green there are ten men. The paris green is precipitated in a large vat. A man stands on a platform at the side of this vat and stirs the liquid with a long handled paddle. The solution spatters around the sides and steam rises from it. The man doing this work had no respirator and none of the others employed here had them; some of the men had little wads of cheesecloth in their noses and ears.

2. From the precipitating vats the paris green is pumped through a filter press which separates it from the solution. From



this press it is put by hand into trays and carried to the drying oven, where a current of hot air passes over it. After it has dried, the trays are carried one by one to the end of the room, slid into an air-tight box with a device by which the tray may be turned over and emptied of its contents without much dust flying out in the room.

3. Dust removal.—Above this box, an exhaust carries the dust into a cloth chamber where it collects. The man who works here said he had been with the firm at that work eleven years. His only protection was cheesecloth wads in his nose and ears. The paris green, after having been dumped from the drying trays, falls into a conveyor that carries it up into a bin from which it goes into the bolter, or screening process, and thence to the next room where it is packed.

4. Packing.—This small room in which the paris green is packed and weighed has no windows at all and no ventilation except that which might come from the outside door when open. Three men work here. They let the paris green out of a chute from the bin into cans or barrels and scoop it up and put it into the kegs which they have put on the scales. One of the men, at the time of the inspection, was tamping the paris green into a large can with a stick. The air was green with the dust and the men's clothing was covered with it. The pieces of cheesecloth with which they protected their heads were streaked with green. The manager explained it was necessary to tamp the paris green down in packing it. The men at this job had not been there long, nor could they talk English.

5. In a room immediately back of this packing room and opening only onto the larger room already described, was a room in which there were a lot of old clothes lying around and about the walls of which the men had fixed up improvised boxes with pieces of gunny-sacking over the front, in which they kept their clothes. On one of these boxes was a beer bucket with some beer still in it and on its lid were spatters of paris green.

6. Washing facilities.—There was no place for the men to wash when they changed their clothes. The manager said the men furnished the pails in which they washed, as he said, "from head to foot every evening." The floor and walls were dusty with paris green. It is difficult to imagine those fellows "washing good from head to foot" with a pail of water, either here or any place else in the plant.

7. Another small room above the one where the packing is done has one window which is not opened. The manager stated it was formerly used for a packing room, but is used now only for storing lumps of paris green, screened from the drying trays. The inspector found a shovel apparently used in shoveling paris green, by the side of a partly filled barrel. The floor and walls and the stairway leading up to the room were laden with paris green. The men working in paris green have less work and lighter than the other men, there being several hours of the day when they have nothing to do. They are paid by the day.

8. The closet for the men consists of a shanty in a court, with pipes for a seat over a trough-like device, which floats the excrement and carries it off.

9. The thing most needed in this place is a bathroom and wash-room with lockers — wooden sinks which become filled with the pigments are not expected to be used by the workmen as wash-basins. Nothing at all is done for the health of the employees except providing gloves for them. Some of the men in the most dangerous work are foreigners, new hands at this work, and ignorant of its danger, as evidenced by the manager's statement. The men should have a lunch room. As it is they have no place to eat except in the midst of the poisonous material which they handle. The ventilation should be improved, particularly in the packing rooms. Automatic devices would eliminate some of the labor now most dangerous.

## APPENDIX B.

## METHOD OF THE INQUIRY.

As already explained in the prefatory note to this report, this investigation was undertaken as a part of the work in a course on "Methods of Research and Statistics" at the New York School of Philanthropy. As a part of the work for this course each student is required to take a personal part in some active investigation or study of some problem involving the original use of the methods which are outlined in the lectures. The entire class for this purpose is divided into groups, one of which undertook the study of lead poisoning. This study was, therefore, necessarily limited to New York city.

After a preliminary study of the literature on the subject of lead poisoning and occupational diseases it was decided that an individual study of cases of lead poisoning should be made, and that, as far as possible, the factories and places of employment of these persons were to be inspected. As a method of getting in touch with cases of lead poisoning certain sources were discarded at the outset; physicians, individually, knew little of lead poisoning, and were willing to give out less; the dispensaries were found to keep such poor records and the addresses that they did have were so generally incorrect that that they had to be discarded; the factory officials and employers were liable to be prejudiced and unwilling to give full or accurate information; trade-unions were few among the workers in lead industries, and inquiries directed to them have produced small results; the life insurance companies yielded no information and the fraternal societies very little. The main sources of information, therefore, were the hospitals, the Department of Health and the Bureau of Labor. Special thanks are due the officers of these institutions, especially Dr. O'Hanlon, of Bellevue, Dr. Guilfoy, of the Department of Health, and Mr. Leonard W. Hatch, of the State Department of Labor.

The records in the hospitals were searched for cases which had been diagnosed as lead poisoning, plumbism, lead colic, painter's colic, saturnine poisoning, encephlopathy and other diseases.

The name, address, date of entering and leaving the hospital, symptoms of each individual and all other facts shown by the hospital record, were taken. Each of these cases, so far as time permitted, was then visited and a detailed statement of the history of the case was obtained.

For the recording of the facts regarding each case of lead poisoning a schedule was drawn up. The main facts desired were,—the detailed industrial history of the individual to discover, as accurately as possible, the things he did, and what the possible sources of infection were; any tendency toward abortion, or tendency toward weakness among his children; and lastly, the personal habits of the victim — habits which are so important in this disease. The schedule as drawn up and later corrected to obtain certain additional information is given herewith.

NAME		ADDRESS			No.	Street	Borough	City	No.
Sex	S. M. W. D.	Date of M.	Place of Birth	Date	Nativity of Parents		Religion		
Date of Immigration		Time in N. Y. City			Inv.				
Industrial Record									
	Date of Beginning Month	Date of Leaving Month	Name of Occupation	Exact Process Performed	Industry	Name of Employer	Address of Employer		
1									
2									
3									
4									
5									
6									
7									
8									
	Usual Weekly Wages	Piece or Time Work	Hours per Week	Hours per Day	Time for Lunch	Weeks Idle Unemp'd	Weeks Idle Illness	Nature of Illness	
1									
2									
3									
4									
5									
6									
7									
8									
							Dates of Attacks		Remarks

## FAMILY HISTORY

	Given Names of Children in Order of Birth	Sex	Date of Birth	Date of Death	Cause of Death
1					
2					
3					
4					
5					
5					
6					
7					
8					

## FACTS CONCERNING WIVES

1. Date of Birth	Death
Miscarriages, date of each	
2.	

## GENERAL FACTS (at time of attack)

1. Were instructions given you concerning the dangers of the work and how to safeguard yourself?
2. Were such instructions posted in the factory?
3. What sort of breakfast were you in habit of eating?
4. How much tobacco do you use and in what form?
5. How much alcoholic drink and in what form?
6. Did you eat in the workroom?
7. Did you wash before eating? Hot or cold water?
8. Do you change your clothing before leaving factory? At home?
9. Did you wear a mustache? Beard?
10. Can poisoning be attributed to any other than industrial causes?  
Canned goods, water pipes, etc.?
11. What precautionary devices have been installed in the lead factories where you have worked? Ventilation, hoods, exhausts, wash-rooms, soap, towels, hot and cold water, overalls, lunchrooms, lockers, doctor respirators?
12. What protective devices might have been put in?

## SYMPTOMS

1. Nature of attack
2. Diagnosis by
3. Permanent effects

An entirely different part of the study was concerned with the factories in which lead in some one of its many forms is used. Special inspections were made of the factories where white lead and lead oxide were made, and all of the factories in this industry were inspected. Factories where paints, varnish, dry colors and pigments were made or mixed, were also inspected. Other industries where lead was known to be employed were also inspected, but the number was by no means as complete. The aim of these inspections was not to count the toilets or windows, or to find children or ungarded machinery,—it was, on the other hand, to learn accurately what the processes of manufacture were, what the dangerous processes were and how they could be safeguarded.

The attempt was always made to inspect the factory where a man appeared to have contracted lead poisoning and, as far as possible, to locate the exact place where he had worked. In this way it was possible to get at the exact cause of the infection.

A large number of photographs were taken, — many of them with flashlights, which were necessary on account of the very dark rooms in which the work was carried on. These photographs aim to show what is actually being done and not especially conditions which are bad, or conditions which are in any way out of the ordinary.

All the information which was collected has been used, with the exception of a few schedules which were so incomplete as to be utterly useless. We believe that the cases presented are typical and represent very nearly the true proportion as between the different industries.





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## APPENDIX VII

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### HOME WORK IN THE TENEMENT HOUSES OF NEW YORK CITY

- a Memorandum submitted by OWEN R. LOVEJOY, *General Secretary National Child Labor Committee.*
  - b Memorandum submitted by ELIZABETH C. WATSON, *of the National Child Labor Committee.*
  - c Photographs submitted by the NATIONAL CHILD LABOR COMMITTEE, THE CONSUMER'S LEAGUE OF NEW YORK, AND MISS LILLIAN D. WALD, Head of the Nurses Settlement, New York.
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# MEMORANDUM ON TENEMENT-HOUSE WORK IN NEW YORK CITY

Submitted by OWEN R. LOVEJOY, *Secretary*  
*National Child Labor Committee.*

NEW YORK, Jan. 12, 1912.

DR. GEORGE M. PRICE, *Bible House, City:*

DEAR SIR.—From the reports of the agents of the National Child Labor Committee on tenement house work in this city, I beg to submit to you the following memorandum. This is not a complete report, as the work is still in progress, but will indicate the nature of information gathered along lines kindred to the work of your Commission. This information, in our judgment, should make a strong appeal to the State Legislature on behalf of the continuance of your Commission and a special appropriation to cover a comprehensive investigation of tenement home work.

The National Child Labor Committee has employed for five weeks, six trained investigators, who have been gathering information from the following sources:

1. Records of the State Labor Department.
2. Advertisements for home workers in city papers.
3. Factories giving out home work with statements from employers as to the number and location of these workers.
4. Intensive study of families with a special reference to employment of children therein.

## *I. Extent of Investigation:*

Number of manufacturing establishments visited..	38
Number of families visited.....	250
Revoked license houses.....	184

*II. Licensed and Unlicensed Houses:*

In addition to the 13,268 licensed houses in which tenements are entitled to manufacture or assist in manufacturing any of the forty-one listed articles specified in section 100 of the Labor Law, the following list of articles have been seen by our agents in process of manufacture in tenement houses. None of these articles are on the list requiring even the annual visit from the factory inspector to ascertain the sanitary condition of the place:

Aviation caps.

Automobile caps.

Sweaters.

Crocheting: Capes.

Shawls.

Dolls' clothes.

Slippers.

Babies' Sacques.

Sweaters.

Caps.

Hoods.

Booties.

Clothing.

Doll's Clothes: Complete outfits. Automobile caps, jumpers,  
Doll's satchels. hats, etc.

Kimonos, etc.

Teddy Bear Legs.

Play Suits: Indian suits: Head dresses.  
Uncle Sam suits: Suits.  
Leggings.

Beading Moccasins.

Beading Bags.

Fine underwear.

Embroideries of all kinds: Chiffon dress patterns.  
Linen suits.  
Shirt waists.

- Jabots.  
 Collars.  
 Cloaks.  
 Embroideries of all kinds: Infants' wear.  
 Silk stockings.  
 Table linen.
- Rosettes of ribbon:  
 Rosettes of chiffon: For slippers and hair  
 Rosettes of chiffon and ribbon: ornaments.  
 Ribbon roses and fancy bows for dress trimmings.
- Fringes.  
 Tassels.  
 Cords.
- Passementaries: Frogs.  
 Buttons (Braid.)  
 Olives (Braid.)  
 Large collars.  
 Lace by yard.  
 Dutch collars.  
 Sailor collars.  
 Revers.
- Irish Crochet: Cuffs.  
 Buttons.  
 Olives.  
 Medallions.  
 Yokes.
- Cutting out scallops.  
 Trimming threads.
- Machine-Made Embroidery: Cutting and folding embroidered  
 handkerchiefs.
- Velvet or silk with fancy silk braid and  
 buttons.
- Millinery Ornaments: Straws stitched on buckram frame.  
 Fancy straw or velvet and braid buckles.
- Braiding Hat Straws.
- Glove Stitching: Kid.  
                     Silk.

Applique cutting — letters for flags, etc.

Coil winders — wire coils for electric devices.

Lamp shades; brushes; belts; garters; suspenders; bead work (necklaces); sorting and sewing buttons on cards; setting stones in hat pins and combs; making lambrequins and kimonos.

### *III. Difficulty of Securing Accurate Lists of Home Workers:*

The difficulty experienced by officials in securing accurate lists of home workers is illustrated by the following incidents:

On November 28, 1911, one of our special agents visited the nut firm No. 1 and learned from the manager that they employ approximately 100 families of out-workers. He stated that all these were licensed families. When asked for a list of the families the superintendent at first refused, then said he would get the list ready to be called for the next day. When called for, this list gave 51 names and addresses (all in licensed houses). On investigating houses — 7 names were not known at given addresses — 11 had not been working on nuts for several months past — and of 41 families an intensive study showed that 19 lived in unlicensed houses.

### *IV. Proportion of Licensed and Unlicensed Houses Visited:*

Brushes.— Manufacture of brushes requires a license. Of 124 families given by brush manufacturers as out-workers, 10 families were found to live in licensed houses, 114 families in unlicensed houses.

Doll's Clothes (operating).— Doll's clothes may require a license, although the law is not clear on this point. Of families investigated, 44 families live in licensed houses; 91 families in unlicensed houses.

Nut Picking — Nut picking requires no license. Among out-workers investigated, 22 families live in licensed houses, 19 families in unlicensed houses.

Embroidery.— Embroidery does not require a license. Of families investigated, 78 families lived in licensed houses; 201 families live in unlicensed houses.

*V. Employment of Children in Tenement Manufacture:*

The following tables are reported:

Nuts.—41 families visited, 9 families have no children of working age, 32 families had 91 children between the ages of 3 and 16, of these 91 children, 77 were found at work, of the following ages:

<i>Number of Children</i>	<i>Ages</i>
2.....	3½
6.....	4
7.....	5
4.....	6
8.....	7
10.....	8
3.....	9
7.....	10
9.....	11
11.....	12
6.....	13
3.....	14

Brushes.—Forty-one families visited, containing 72 children. Out of these, 69 children were working, of the following ages:

<i>Number of Children</i>	<i>Ages</i>
2.....	4
1.....	5
7.....	6
3.....	7
5.....	8
11.....	9
6.....	10
4.....	11
6.....	12
4.....	13
16.....	14
2.....	15
2.....	16

Doll's Clothes (making).—Sixty-six families visited had 35 children from 4 to 14 years of age; 35 children were found working of the following ages:

<i>Number of Children</i>	<i>Ages</i>
2.....	4
2.....	5
4.....	6
3.....	7
3.....	8
2.....	9
7.....	10
4.....	11
4.....	12
3.....	13
1.....	14

Flowers.—The extent to which child labor exists in this form of home work is impossible to discover. Our report showed that during the week December 8-15, 15 houses visited showed 51 children from 7 to 14 years of age working on flowers. The following week, December 17-28, a survey of 33 families showed a list of 70 home-working children from 4 to 15 years of age, distributed by age as in the following chart:

<i>Number of Children</i>	<i>Ages</i>
3.....	4
7.....	5
3.....	6
6.....	7
4.....	8
8.....	9
10.....	10
9.....	11
9.....	12
5.....	13
5.....	14
1.....	15



Total, 70 children working on flowers during Christmas vacation week in 33 families.

#### *VI. Complete Inspection is Impossible:*

Under the present license systems manufacture of the articles specified in the list is presumably subject to inspection, but attention is called to the fact that many of these goods are made in homes beyond the jurisdiction of the Factory Inspection Department of New York. We have records of doll firms sending clothing to be made to Atlantic City, N. J., Easton, Pa., Hoboken, N. J., Elizabeth, N. J., Westfield, N. J., points in Long Island and Connecticut and some even as far away as Florida. Many of the people receiving these goods to be made are themselves contractors who subcontract their work. It is impossible for the Factory Inspection Department to follow the workers in these ramifications.

One embroidery firm reported that they send their embroidery into outlying districts to be put up in skeins, and the same firm sends out underwear to be made by hand at home. Then the underwear made in homes and skeins of floss prepared in homes go out again to another set of workers who embroider the garments. This firm has 350 outworkers and 20 contractors on embroidery alone.

#### *VII. Revoked Licenses:*

Our agents followed up 184 houses in which the license has been revoked and which are listed in the monthly bulletin of the State Department of Labor as having licenses revoked. The manufacturer has been officially cautioned not to give work to people living at these addresses. Our agents report the following list of the 184 houses:

46 houses torn down.

12 houses turned into lodging houses.

126 tenements standing.

In 18 of the 126 tenements home work was being done. The following articles were being made:

Artificial flowers.	Embroidering pillow tops.
Finishing men's clothing.	Making flannelette undershirts.
Making hats	Lining fur collars.
Neckwear.	Silk flowers.
Sewing fancy feathers.	Running ribbons in underwear.
Picking nuts.	Embroidering underwear.

All of this list requires a license, except embroidering pillow tops.

In all the houses in which finishing of clothing, working on silk flowers for neckwear and picking nuts were carried on, children were found at work.

In view of the information we have gathered, only a meager summary of which is submitted above, it is the opinion of the National Child Labor Committee that this problem presents one of the most important phases of the industrial situation which the Factory Investigating Commission was appointed to study. In a recent conference with representatives of the New York Child Labor Committee, The National and New York City Consumers' League, and other organizations interested in the welfare of children, I was directed to advise you that we strongly urge the continuance of the Commission and recommend that an appropriation be asked to cover an adequate investigation of this subject. My advisors, many of whom are familiar with the details of such investigations, estimated that not less than \$15,000 would be required to make this study, although by selecting special districts and special industries, doubtless a less amount would yield illuminating and accurate results.

Respectfully yours,

OWEN R. LOVEJOY,

*General Secretary.*

## MEMORANDUM ON SOME PHASES OF HOME- WORK IN THE NEW YORK TENEMENTS

By MISS ELIZABETH C. WATSON, *of the National Child  
Labor Committee.*

The family budgets of 100 families employed in the feather industry show that the budget is small, *not* because the father is lazy, but because his daily wage is not sufficient to carry him through the dull season of his industry.

Many of them, skilled workmen, carpenters, bricklayers, rock drillers, etc., etc., have a good daily wage, but the entire situation is summed up when we begin to consider the days for which he is not paid:

52 Sundays.

5 legal holidays (out of 12 legal holidays).

143 days of rain, winter weather and slack seasons when there is no work.

Many of the men, day laborers, stone workers, etc., are subject to rheumatism, brought on through exposure in the work, are unable to work in the open when the weather is cold. The family supplement this income by taking work into the home, where we frequently find this same out-of-work father helping in the home industry.

In some industries we find, at times, the work in the factory slack, workers laid off or on part time, while large amounts of work are being given to the houseworkers. Again we find places where none of the making of the article is done in the factory and only a small group of workers are employed there to put materials into shape for the jobber. (Brushes particularly.)

Again we will find a small storage room just for the giving out and receiving of the finished work. Such places sometimes have 400 outworkers, some of whom are again contracting to outworkers, and it is almost impossible to show up the insidious outreachings into new districts, other towns, etc. Recently we have found an industry that sends its work all over the country, the manufacturer himself — a German, resenting a system whereby he does not know the conditions under which his goods are being made.

The competition between each other, and with factory hands, makes it impossible to regulate or standardise a wage for women in any industries involving home manufacture.

In order to show the effect of this on wage, we have only to mention what has happened in willowing of ostrich feathers. Three years ago when the trade started, there were few workers in the field. Fifteen cents was paid for tying one set of knots per inch. The following season more workers were in the field and the price went down to thirteen cents. Then it dropped to eleven, nine, seven, five, and last summer, just three years from the time it started, the workers were receiving three cents an inch; and this fall they are working by the piece. Formerly the price paid per inch in the shop was from two to three cents an inch more than in the homes, but this fall the price paid in the shop is three cents an inch, the same price that was being paid in the homes. One plume, which contained 8,613, took a woman and two children a day and a third to tie.

Health.—I have seen a girl in the descending stage of scarlet fever (when her throat was so bad that she could not speak above a whisper) tying ostrich feathers in the Italian district. These feathers were being made for one of the biggest feather factories in the lower part of the city. She told me herself she had been sick with scarlet fever for ten days, but had been upstairs in a neighbor's rooms working for over a week. The skin on her hands was in such condition as to attract my attention and be recognized at once as scarlet fever although she further authenticated it by telling me the doctor stated she had scarlet fever.

I have seen a baby two years old in its mother's arms (while she was finishing clothing), whose head was a raw sore from a disease known as impetigo, a very disagreeable and very contagious, though not dangerous skin disease.

I have seen men, women and girls with tuberculosis, who said they had tuberculosis, were going to tuberculosis clinics, working on dolls clothes, picking nuts, working on feathers, working on crocheting slippers.

Our investigators have told us many stories of work being done in homes where there were sick mothers or sick members of the family whose cases after being reported and looked after, proved to be cases of tonsillitis.

## IN FAMILIES DOING NUTS AND DOLLS' CLOTHES

OCCUPATION OF FATHER	Wage per week	Rent per month	Number in family	Number of children	Age of oldest child	Age of youngest child
Baker.....	\$18 00	\$14 00	6	4	12	3
Barber.....	12 00	15 00	3	1	17	.....
Bookbinder.....	15 00	11 50	8	4	15	10
Bottler.....	12 00	8 00	3	1	.....	.....
Butcher.....	15 00	13 00	3	1	14	.....
Candy factory.....	15 00	11 50	8	6	15	5
Cap cutter (in season).....	20 00	18 00	6	4	17	4
Carpenter.....	18 00	12 00	10	8	17	3
Cement.....	12 00	6 00	4	2	8	3
Chauffeur.....	12 00	12 00	2	.....	.....	.....
Coal man.....	12 00	13 00	4	2	16	11 m
Cobbler.....	16 00	17 50	5	3	7	22 mos.
Cook.....	9 00	11 00	2	.....	.....	.....
Driver.....	15 00	11 50	4	2	15	10
Driver.....	15 00	13 00	5	3	4	2
Driver.....	13 00	12 50	5	3	13	10
Driver.....	12 00	14 00	6	4	15	5
Elevator man.....	9 00	15 00	7	2	7	6
Factory hand.....	12 00	15 00	7	4	20	8
Furniture cleaner.....	9 00	17 00	7	5	18	9
Gen. El. Co.....	10 00	15 00	6	3	13	9
Hod carrier.....	15 00	14 00	5	3	11	1½
Insurance agent.....	10 00	16 00	4	3	13	9
Janitor.....	10 00	10 00	4	2	9	2
Jewelry mender.....	12 00	5 00	3	1	.....	.....
Laborer.....	15 00	12 00	6	4	17	9
Laborer.....	9 00	16 00	4	2	14	7
Laborer.....	9 00	8 00	3	1	6	.....
Machinist.....	12 00	13 00	3	1	1 week	.....
Marble cutter.....	11 00	11 00	2	.....	.....	.....
National biscuit.....	12 00	11 00	4	2	2	14 mos.
Packer.....	12 00	13 00	3	2	2	2 mos.
Painter.....	15 00	12 00	5	3	3	2
Pencil factory.....	9 00	13 00	3	1	10	.....
Plumber.....	24 00	14 00	5	3	9	5
Policeman.....	29 00	16 00	8	6	16	4
Polisher (brass work).....	12 00	11 00	3	1	14	.....
Printer.....	12 00	7 00	2	.....	.....	.....
Rag man.....	10 00	13 00	8	6	15	6
Rag shop.....	10 00	10 00	6	4	18	14
Salesman.....	15 00	15 00	7	4	19	9
Saloon clerk.....	9 00	12 00	10	6	16	6
Shipping clerk.....	10 00	11 00	2	.....	.....	.....
Soap factory.....	10 00	17 00	6	4	18	11
Stone maker.....	8 00	12 00	6	.....	17	9
Street cleaner.....	9 00	12 50	5	3	17	9
Switchman.....	1 050	10 00	7	5	14	7 mos.
Tailor.....	14 00	16 00	5	3	11	4
Tailor.....	12 00	13 00	6	4	7	5
Tel. Co.....	15 00	13 00	3	1	6	.....
Dead.....	.....	12 00	4	2	18	5

## IN 100 FAMILIES DOING FEATHERS.

## OCCUPATION OF FATHERS.

	<i>Families</i>
*Building trades . . . . .	36
*Unskilled labor . . . . .	25
Shops and stands . . . . .	5
Small trades . . . . .	15
*Ice and coal dealers . . . . .	6
Saloons . . . . .	2
Miscellaneous . . . . .	4
Incapacitated or dead . . . . .	7
	<hr/>
Total . . . . .	100
	<hr/> <hr/>

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\*Average working year 200 days.

## APPENDIX VII

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Photographs Submitted by the Consumers' League and  
Miss Lillian D. Wald of the Nurses' Settlement,  
New York



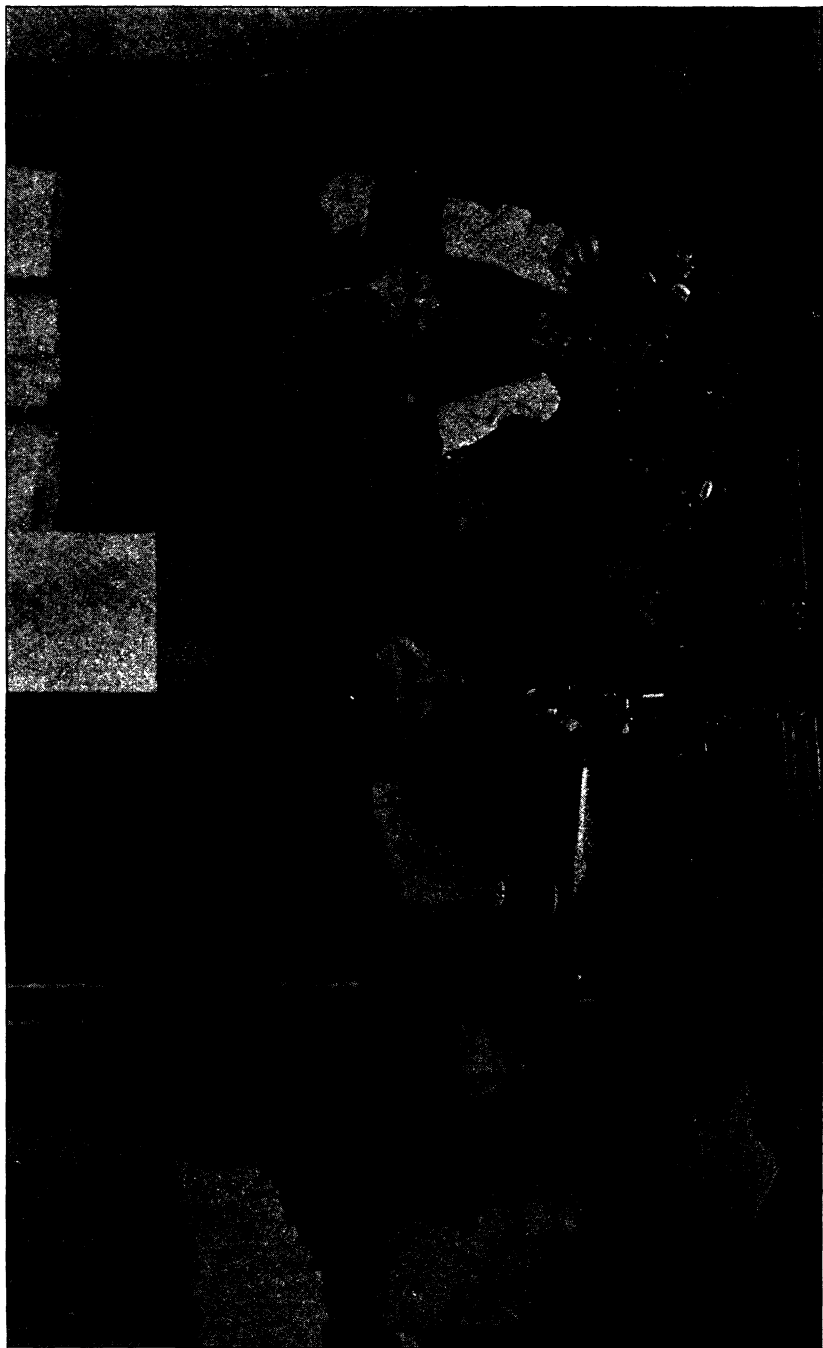




Children sewing after school.







Working at garters. Mother, a widow, earns 75 cents a day by working all day until 12 at night. Bessie works until 10 p. m. Sophie until 9 p. m. They expected to work until 10 p. m. to finish job although they did not know when more work would come in.

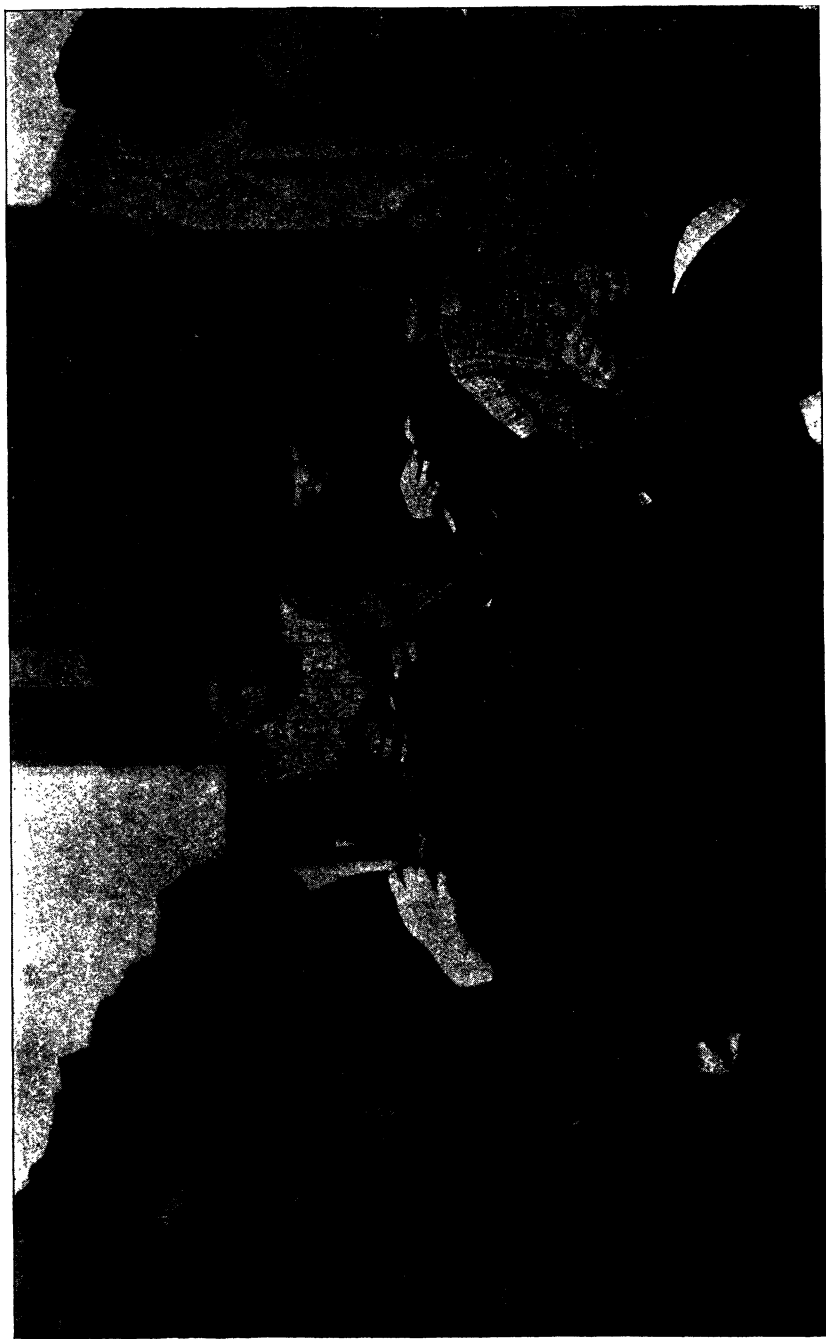




Earn four cents a gross making violets. Can make twenty gross a day when children work all day. Father has work. The children work on Saturdays and on afternoons after three o'clock and evenings until 8 or 9.





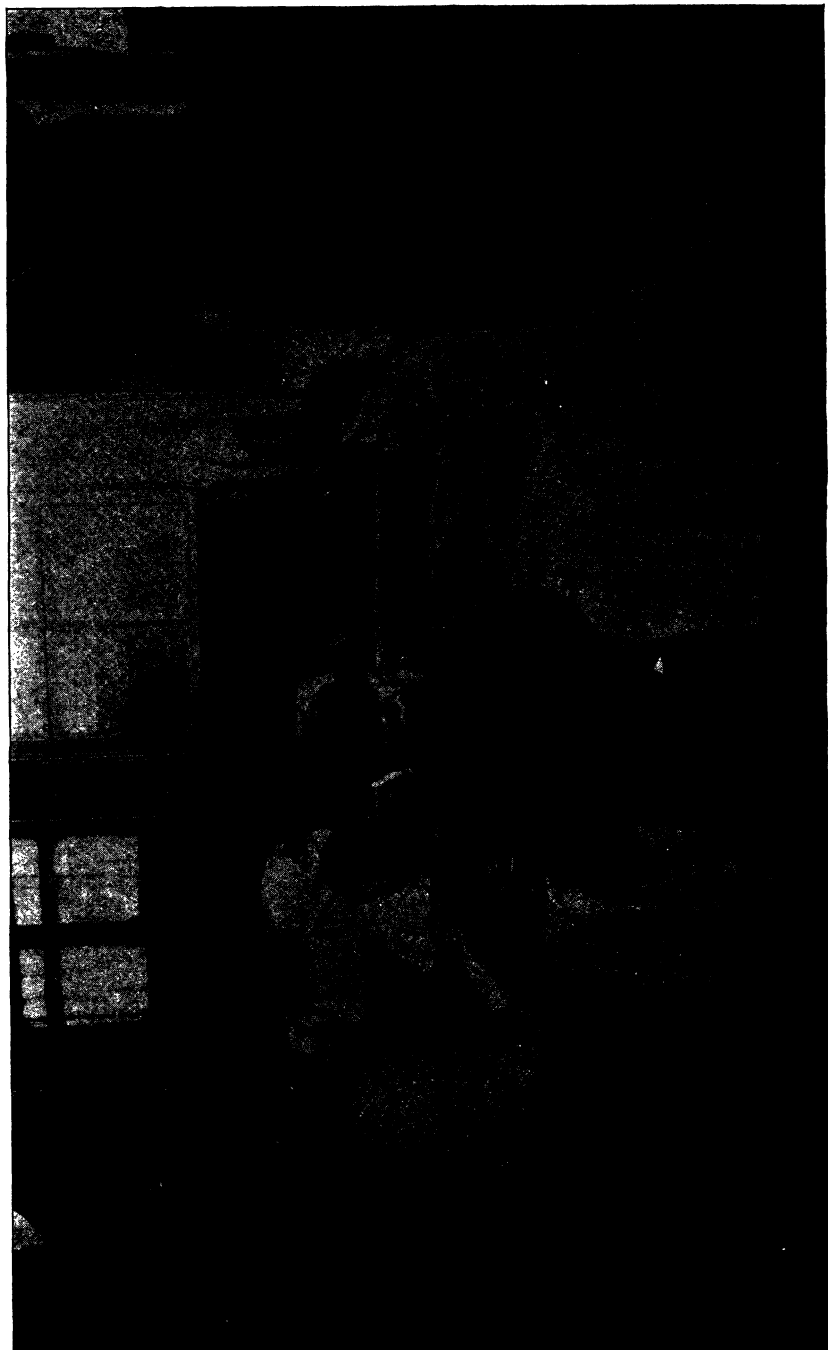


These children work after school until 9 p. m. and get five cents a coat. Can do six or seven coats and more on Saturdays. Father has no work and mother helps.





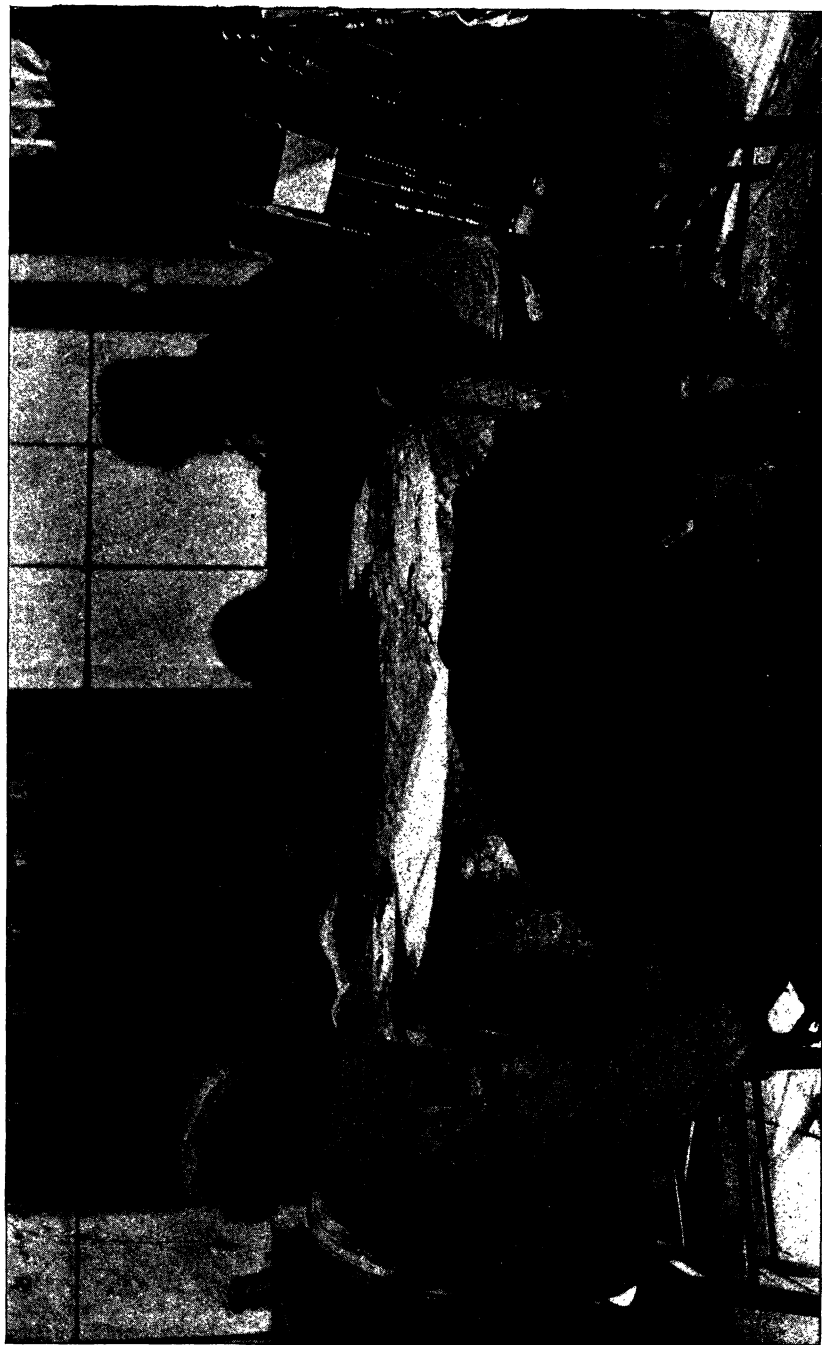




Tenement on Laight Street. Little girl cracking nuts with her teeth. The mother had just been doing the same. The little girl has cross eyes. The boy about 8 years old works too. Some of them work until 8 or 9 p. m. at times. Boy holding baby is foolish. Husband works on railroad part of the time.







Laight Street family. Coffee sorting in tenement. Picking over coffee "sweepings." The "sweepings" cost 25 cents a sack at the warehouse, and the coffee picked out and roasted sells at about 12 cents a pound. Man working with sore hand bound up in filthy old bandage. Children work after school hours and on Saturdays.





Family of M., Sullivan Street. Father has been ill for two years and is unable to do heavy work, but makes artificial flowers all day. Gets six cents a gross and makes regularly from ten to twelve gross a day. Ages of children 14, 11 and 4. The boys work evenings until 10, sometimes 11, and on Saturdays. The four-year old child separates petals.





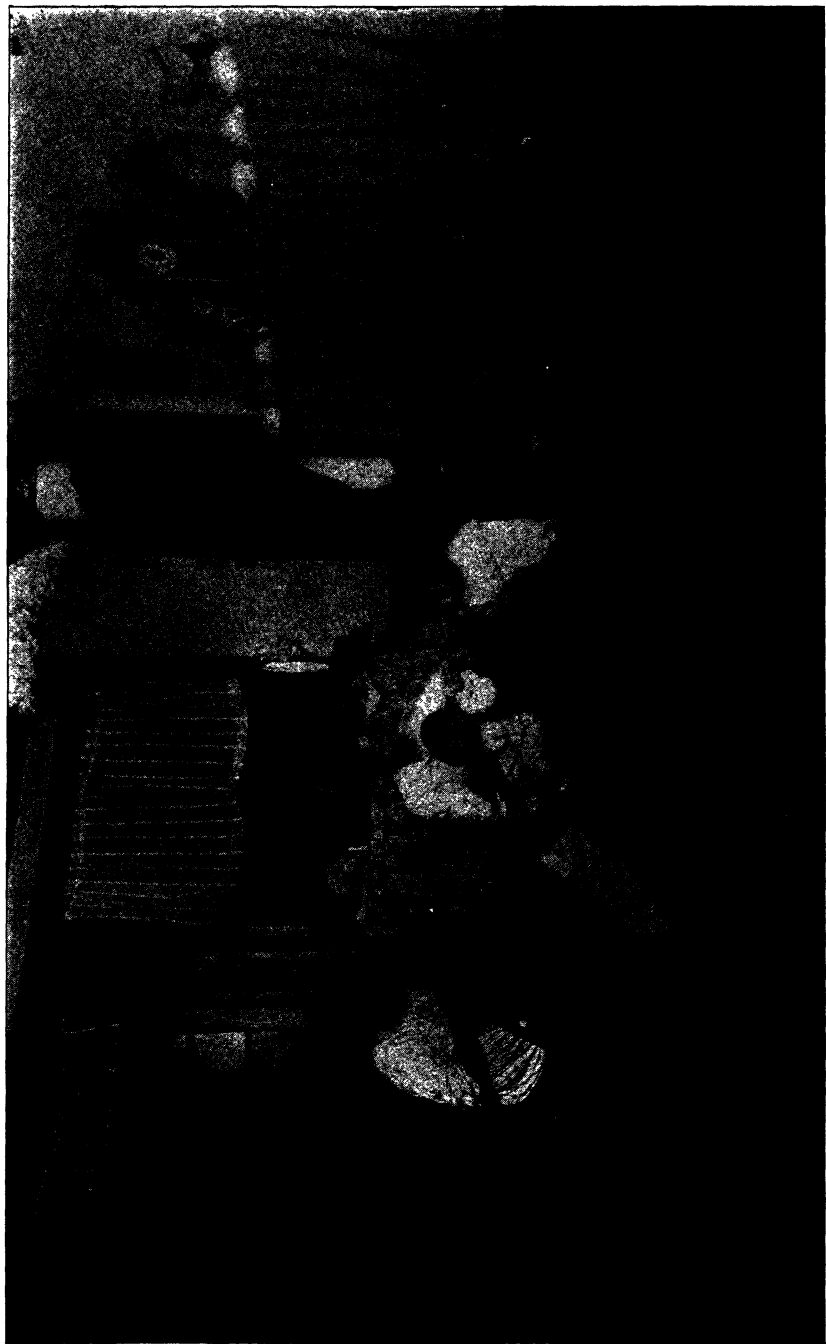


Artificial flower making. The youngest child is five years old. They get four to eight cents a gross.



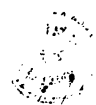


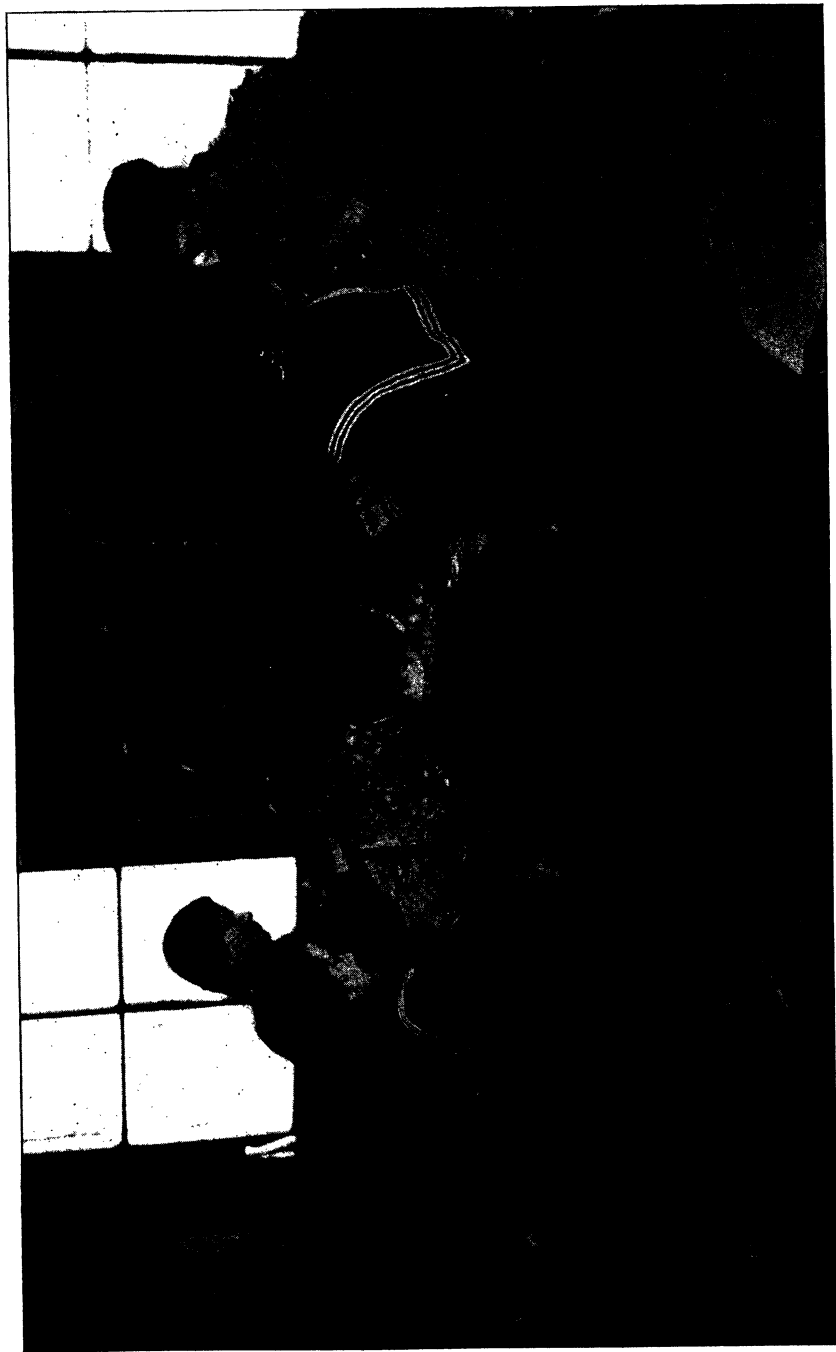




Home of Mrs. L., Hamilton Street. Working on clothing. The eight-year old girl who spoke no English said she sewed during her noon recess. Child on floor pulling out basting threads. Too young to go to school. Infant on mother's lap. Woman sitting on trunk is a neighbor who works with the family. The husband works in the street. Photograph taken at noon.







Mrs. N., Sullivan Street tenement. Father has work outside of house. Mother and children, ages 12, 10 and 6 working at artificial flowers. The youngest pulls the petals apart. The children sometimes work until 9 p. m. They say the family earns three cents a gross making violets, and can make fifteen gross when the children work all day.







One of the children not working. They go to school and work afternoons on this custom work for father.



## APPENDIX VII

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Photographs Submitted by the National Child Labor  
Committee of the City of New York







Making lace collars at home (usually in kitchen). Mrs. V., East 110th Street, working with baby asleep in lap. Her sister, Tessie, 15 years old works all the time. Some days she says she makes over \$1 a day. At times only \$2 a week. One of them was making lace for a contractor. The other was making lace for factory. Husband is a plasterer and "works some." Photo by L. W. Hine, Dec. 19, 1911, 4 p. m.







Mrs. Florence R., E. 110th Street, N. Y., ground floor, and three children who work on willow plumes. Tony is 7 years old, Annie 10. Ruby, 12, has worked some months. All make \$2.50 a week. Father is a butcher. Photo by L. W. Hine, Dec. 18, 1911.



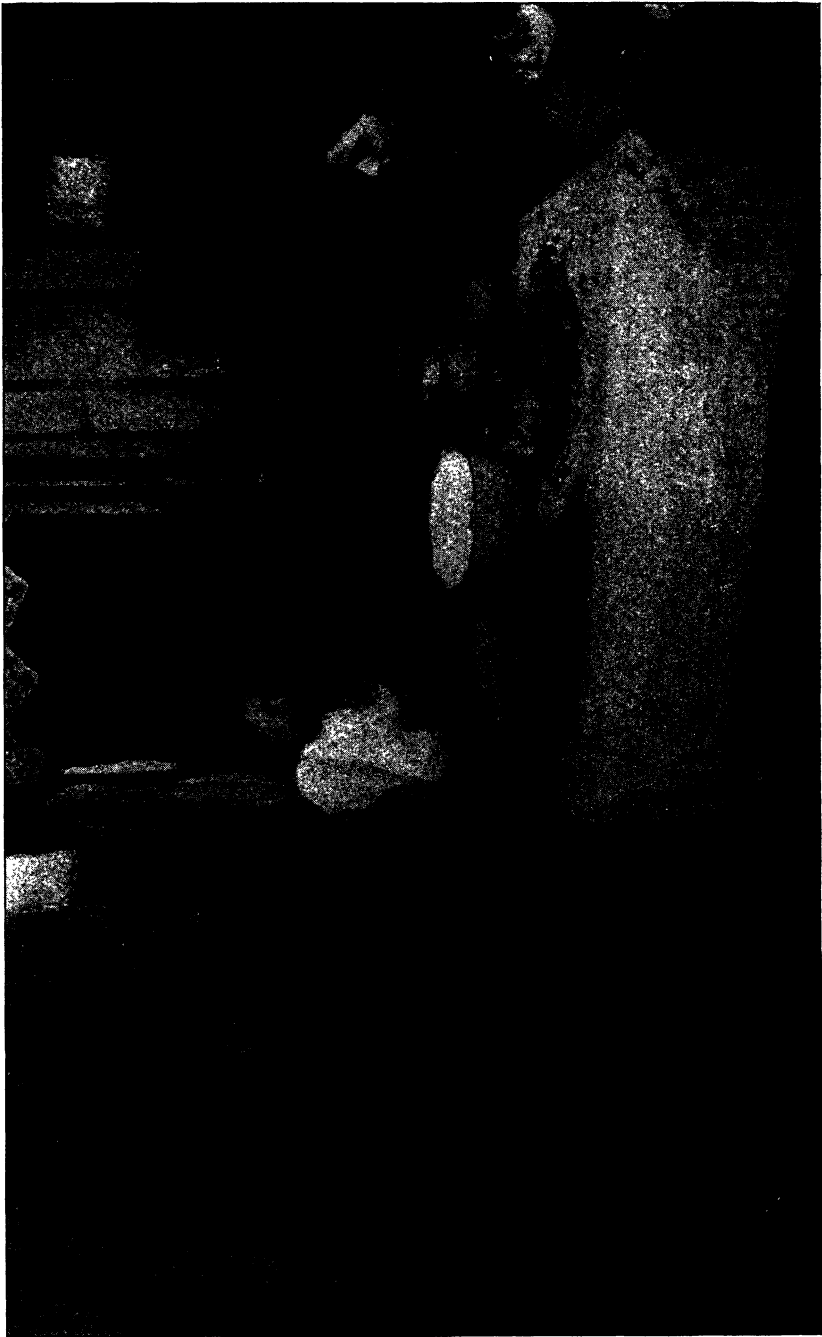




Twelve and 15 year old girls knitting caps in "Little Italy." Jerome Avenue (The Bronx). Florence V., 12 years old, and sister Jennie, working on crochet hats, in dirty kitchen of tenement, Jerome Avenue. They make heavy hats, muffs, scarfs, slippers, etc. Jennie, 15 years old, works in a Tremont avenue factory part of the time. Can make 1½ dozen heavy hats a day. Florence makes five hats in half a day being in school only half a day. Have been at it one year. Photo by L. W. Hine, Dec., 1911.





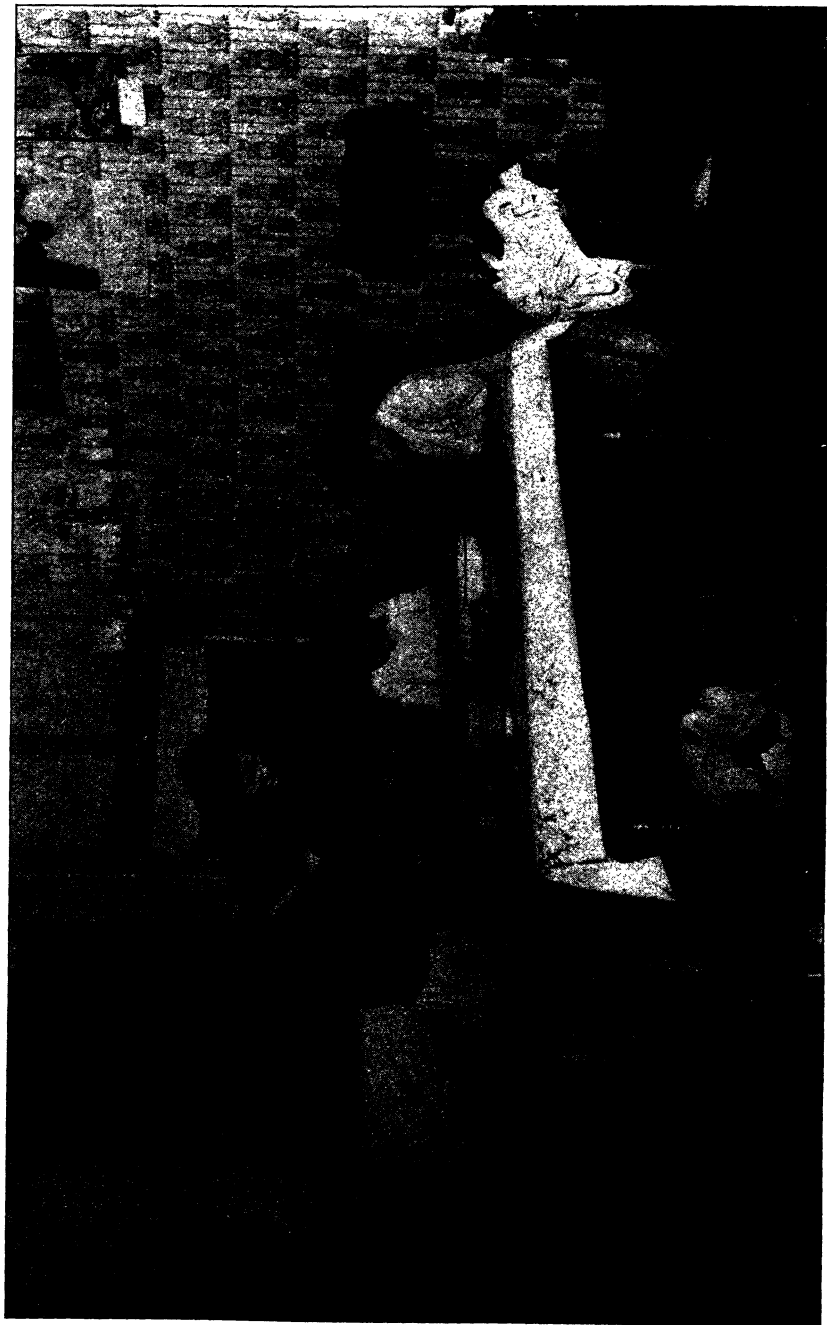


Mrs. R., Laight Street, picking nuts with dirty baby in lap. Two neighbors helping. Girl is cracking nuts with her teeth, not an uncommon sight. Mr. R. works on dock. Photo taken Dec. 13, 1911, by L. W. Hine.









Hudson Street, ground floor. Mrs. S., Joe, 10 years old, Josephine 14, Camille 7 years, picking nuts in a dirty tenement home. The bag of cracked nuts on the chair had been standing open all day waiting for the children to get home from school. The mangy cat under the table roamed about over everything. Baby is sleeping in the dark inner bedroom, 3 years old. Photo by L. W. Hine, Dec. 6, 1911, 4 p. m.







Mrs. Mary M., E. 110th Street, 2d floor. Family work on feathers. Make \$2.25 a week. In vacation two or three times as much. Victoria, 8 years; Angelina, 10 years (a neighbor); Firrandi, 10 years; Maggie, 11 years. All work except two boys against wall. Father is street cleaner and has steady job. Girls work until 7 or 8 p. m. Once Maggie (11 years) worked until 10 p. m. Photo by L. W. Hine, 5 p. m., Dec. 19 1911.







The father had been picking nuts but refused to be photographed. He is out of work. Tommy M., 5 years, picks some; Minnie, 7, Rosie, 9 and Angeline, 11. Make \$3 to \$4 a week. Hudson Street, N. Y. Photo by L. W. Hine, Dec. 12, 1911. 4.30 p. m.





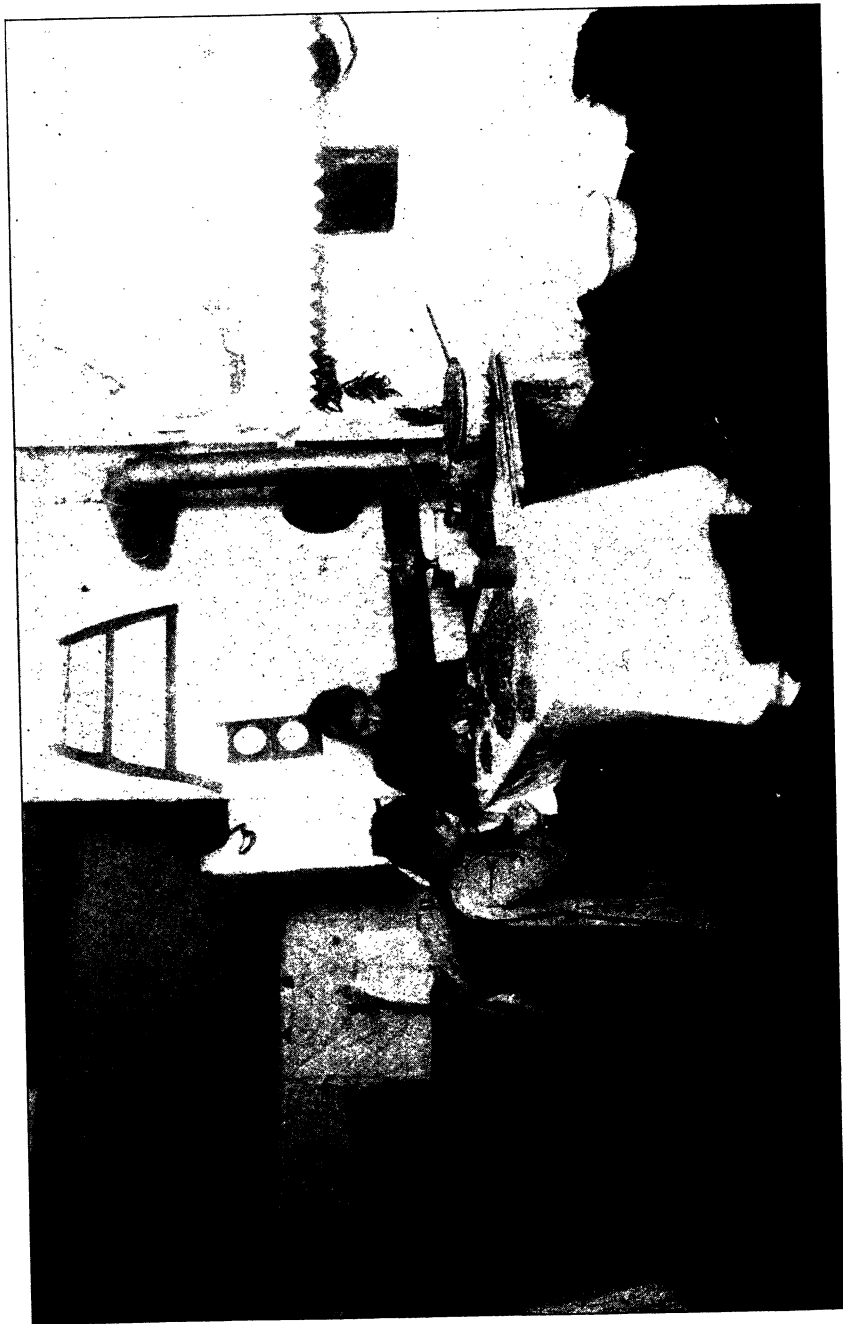


Rose V., 9 years old, helping her mother on corset covers. [Sullivan Street, 3d floor back.  
Photo by L. W. Hine, Dec. 26, 1911.









Tessie S., 12 year old girl, and her mother picking nuts in attic of tenement, Hudson Street, N. Y. She holds the nuts against her dirty apron as she picks them out. Works until 9 p. m. some nights. They live in two small rooms, paying \$5 a month rent. Make \$2 a week. A 15-year old brother works in a factory and sleeps in folding bed in this room. Photo by L. W. Hine, Dec. 12, 1911. 3.30 p. m.







He has no employment. Marion Z., Hudson Street, N. Y. Mother picks nuts in nut factory, Hudson and Laight Streets. Gets \$4 a week. The children say they make \$3 a week. Michael is 13 years old, Madeleine 6 years and has cross eyes. Were working in a very dim light (no gas or lamp used except when most necessary). Photo by L. W. Hine, Dec. 12, 1911, 4.15 p. m.



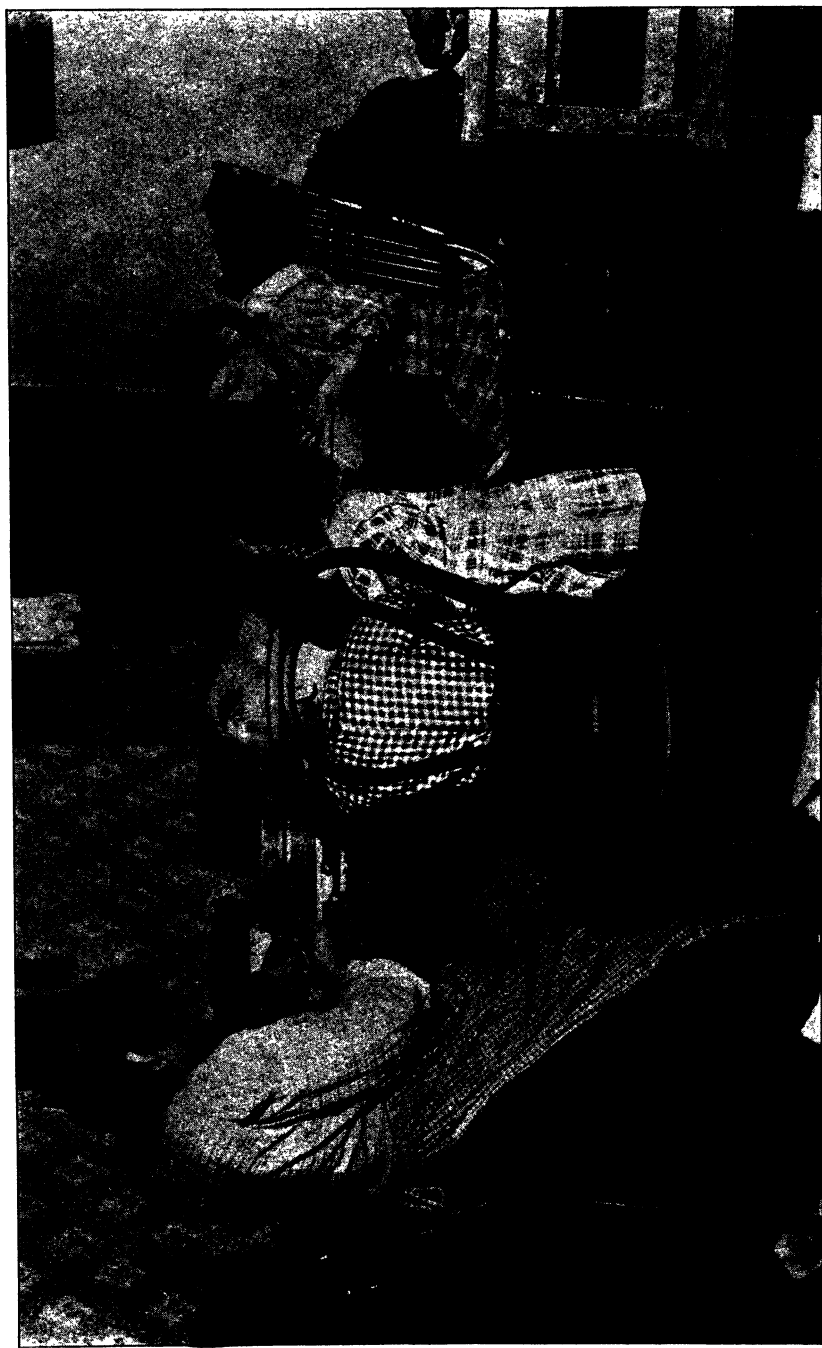




Picking nuts in dirty basement, Hudson Street. The dirtiest imaginable children were pawing over the nuts eating lunch on the table, etc. Mother had a cold, blew her nose frequently (without washing hands) and the dirty handkerchief reposed comfortably on the table and close to the nuts and nut meats. The father picks now. "No work to do at my business." Has a cobbler's shop in the room. They said the children didn't pick now. (Probably a temporary respite.) Photo by L. W. Hine, Dec. 13, 1911, 3:30 p. m.







Mrs. Lucy L. and family. Johnnie, 4 years old; Mary, 5; Millie, 8; picking nuts in the basement tenement, Hudson Street. Mary was standing on the open mouth of the bag holding the cracked nuts (to be picked), with her dirty street shoes on and using a huge dirty jack-knife. On the right is the cobbler's bench used by shoemaker in this room. They live in dark inner bedrooms and filth abounds in all the rooms and in the dark, damp entry. Photo by L. W. Hine, Dec. 16, 1911, 4.15 p. m.









Mary P., 13 years old. Short-sighted girl with glasses working after school on flowers with Mrs. Mary D., Mary's aunt. Mott Street, 3rd floor front. Photo by L. W. Hine, Dec. 15, 1911. 4.30 p. m.



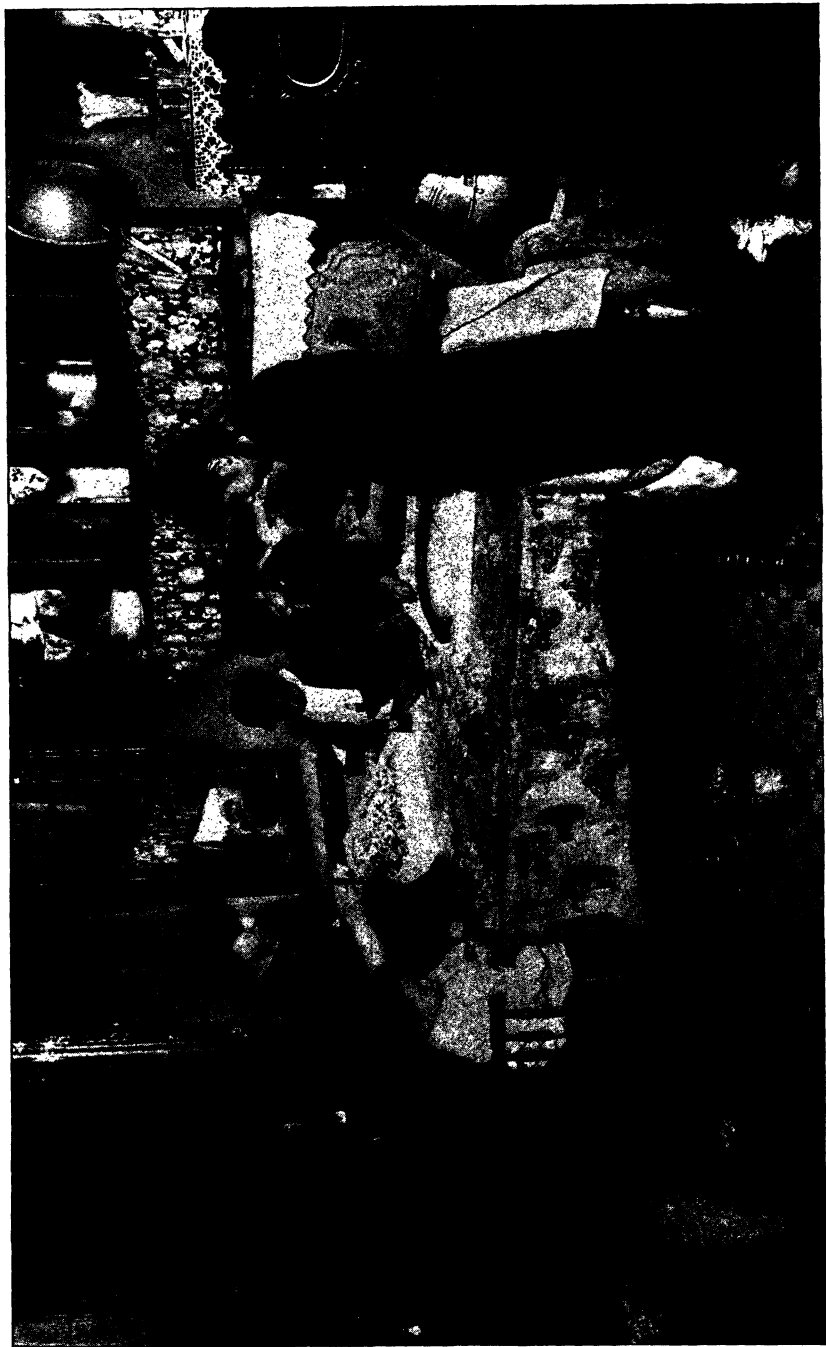




A common scene in the tenements. Father (out of work) sits around. *sometime nothin'.* Helen 5 years old and Adeline 10 years help pick nuts. Tessie, a neighbor, helps too. Adeline works until 9 p. m. at times. All work together.







Family of Mrs. M. making flowers in a very dirty tenement, Mott Street, top floor. Josephine, 13 years old, helps outside of school hours until 9 p. m. sometimes. She is soon to be 14 and expects to go to work in an embroidery factory then. Says she worked in that factory all last summer. Nicholas, 6 years old and Johnnie, 8, work some. So does Rosie, 11 years (not in photo) who has been sick a good deal. All together only earn forty cents to fifty cents a day. Baby (20 months old) plays with the flowers, putting together, and they expect he can help a little before long. Father drives a coach or hack irregularly. Dec. 13, 1911, 4 p. m. L. W. Hine.







Mrs. De M., Leight Street, front, nursing a dirty baby while she picks nuts. Was suffering with a sore throat. Rosie, 3 years old, hanging around. Genevieve, 6 years old, Tessie, 8 years, pick too. Make \$1.50 to \$2 a week. Husband on railroad, works sometimes.

4.30 p. m., Dec. 13, 1911. Photo by L. W. Hine.











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**APPENDIX VIII**

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**QUESTIONNAIRE ISSUED BY COMMISSION AND  
DIGEST OF REPLIES RECEIVED**

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# **I. QUESTIONNAIRE**

## **LIST OF QUESTIONS CONCERNING METHODS FOR IMPROVING THE CONDITIONS UNDER WHICH MANUFACTURING IS CARRIED ON IN CITIES OF THE FIRST AND SECOND CLASS OF THE STATE**

### **JURISDICTION OVER FACTORIES AND MANUFACTURING ESTABLISHMENTS IN NEW YORK CITY.**

1 a. Should there be a Department of Labor for the city of New York and one for the rest of the State?

b. Should there be one or three Commissioners at the head of each of those Departments?

2. Should the Board of Health of New York city have sole jurisdiction over bakeries in tenement houses and elsewhere?

3. Should the Tenement House Department of the city of New York have sole jurisdiction over all manufacturing in tenement houses and over bakeries and confectionery establishments conducted in tenement houses?

4. Should there be a Bureau of Inspection established whose function it shall be to inspect factories and manufacturing establishments and report existing conditions to the different departments charged with the duty of enforcing the provisions of the law on the subject; the Bureau of Inspection to report the facts to the responsible department, the latter to secure compliance with the provisions of the law applicable to the condition reported?

5. Should there be a new department established for the city of New York to have exclusive jurisdiction over all factories and manufacturing establishments other than those carried on in tenement houses (the new department to possess all the powers which are now held by the State Labor Department in the city of New

York, the Building, Fire and Health Departments of the city with reference to factories and manufacturing establishments)?

6. What bureaus should be established in such new department?

7. What suggestions have you tending to lessen or do away with the duplication of inspections in the city of New York by various city and State departments?

8. What other suggestions have you which would tend to centralize the authority and responsibility for the enforcement of the laws relating to factories and manufacturing establishments in the city of New York?

#### STATE LABOR LAW.

##### *Factory Inspection:*

9. Is the present system of factory inspection adequate?

10. How often should manufacturing establishments be inspected.

11. Should the number of inspections a year depend upon the character of the industry?

12. How many factory inspectors should the Department of Labor have?

(a) For the City of New York?

(b) For the rest of the State?

13. How many supervising inspectors should the Department of Labor have?

14. How can the services of inspectors with technical knowledge be procured?

15 a. Should violation orders be sent direct to the violator from the sub-offices of the Department of Labor instead of having to go through the Albany office?

15 b. What measures should be adopted to do away with the duplication of inspections by city departments and the State Department of Labor and to bring about the necessary co-operation between city and State officials charged with the duty of inspecting factories and manufacturing establishments?

*Museum of Safety:*

16. Should there be a Museum of Safety established?

(a) As a branch of the State Labor Department?

(b) As a private institution endowed by the State?

17. Should the Labor Department publish and circulate from time to time a list and description of safety devices in the various trades and industries?

*Medical Inspection:*

18. Should there be a division of medical inspection in the State Labor Department?

19. Should there be a board of medical advisers to the State Commissioner of Labor appointed by the Governor?

*Power of Commissioner to Make Rules and Regulations:*

20. Should the Commissioner of Labor be given the power to make rules and regulations to cover accident prevention and proper sanitation in different industries?

21. Should there be a board of technical experts appointed by the Governor to advise the Commissioner in the formulation of these rules and regulations and their revision from time to time?

*Penalties for Violation of Law:*

22. What additional summary powers should be given to the Commissioner of Labor to enforce the provisions of the Labor Law?



23. What measures would you recommend to bring about a more speedy and effective punishment for violations of the provisions of the Labor Law?

*Registration and Licensing of Factories:*

24. Should there be a compulsory system of registration of all factories and manufacturing establishments in the State?

25. Should plans be filed showing the location of machinery, partitions, etc., and such plans approved before any new factory or manufacturing establishment is operated?

26. Should a license be required (a) for all factories and manufacturing establishments? (b) In what cases should such license be required?

*Water Closets:*

27. Should there be a provision in the law specifying the number of toilets to be installed? How many should be required for each 25 persons employed?

*Removal of Dust, Gases and Fumes:*

28. What provisions should be added to the law that will cover the removal of dust caused by materials used in an industry or by the nature of the industry itself rather than by machinery??

29. What measures should be adopted for the removal of gases and fumes?

*Ventilation:*

30. Should there be a standard of ventilation?

31. What should the standard of ventilation be?

32. How many cubic feet of air space per person in the day time? (a) When gas is used for lighting purposes? (b) When electric lights are used?

33. How many cubic feet of air space per person in the night time?

34. When should mechanical ventilation be made mandatory?

35. (a) Should the number of persons employed be limited in proportion to the floor area? What should the standard be?

(b) Should there be a standard of temperature in all factories and manufacturing establishments? What should the standard be?  
*Eating Meals in Workrooms:*

36. Should the eating of meals in work shops be prohibited generally? In what specific industries should it be prohibited?

*Lighting Facilities:*

37. What measures would you recommend to improve artificial lighting facilities in factories and manufacturing establishments?

38. Should there be a standard of intensity and brilliancy of light, and what should this standard be.

*Accident Prevention:*

39. Should there be a provision making it mandatory to maintain lights in front of all elevator openings?

40. What measures would you recommend that would tend to prevent elevator accidents?

*Occupational Diseases:*

41. What is the extent of occupational poisonings and diseases in the State of New York?

42. What measures would you recommend to check such poisonings and diseases?

43. Do you favor compulsory physical examination of employees in dangerous industries?

44. How can physicians co-operate to bring about a more thorough knowledge of the prevalence and extent of occupational poisoning or diseases and the method of combating them?

45. What is the extent of industrial consumption among factory workers? What measures should be adopted to check the disease?

*Employment of Women and Children in Industry:*

46. In what industries should the employment of girls be prohibited? a. Under 16 years of age? b. Under 21 years?

47. In what industries should the employment of women be prohibited?

48. In what industries should the employment of males be prohibited? a. Under 16 years? b. Under 21 years?

49. What measures would you recommend to prevent the employment of physically unfit children? Should there be a compulsory physical examination of children periodically up to 18 years of age in all industries?

50. How should the employment of women be prohibited immediately before and after child birth?

*Hours of Labor:*

51. What changes would you recommend in the existing laws relating to the number of hours per day or week that women or children are permitted to work?

52. How can seven days in the week labor be prevented in all industries?

53. Should female minors or male minors between the ages of 16 and 18 years be under any circumstances permitted to work more than ten hours?

54. Should male minors between 16 and 18 be permitted to work after 10 P. M. or before 6 A. M.?

55. Should the number of hours of work per day or week be limited in the case of male minors between the ages of 18 and 21 years?

56. Should a one-hour lunch period be made mandatory?

*Bakeries:*

57. Should the use of cellars for bakeries be prohibited?

a. In case of bakeries already in existence?

b. In the future?

58. What standard of ventilation should be made mandatory in existing cellar or basement bakeries?

59. Should existing bakeries in which the distance between the floor and ceiling is less than nine feet be declared unlawful?

60. Should existing bakeries, the floors of which are of a depth greater than 4 ft. 6 in. below the street or sidewalk level adjacent to the building, be prohibited?

61. Should employees in bakeries be required to furnish a medical certificate of fitness?

62. Should there be a compulsory physical examination made periodically of employees in bakeries?

63. What should be the minimum requirements of ventilation, light, height of ceiling, distance below street level, in basement bakeries to be opened in the future?

64. Should all bakeries be licensed?

*Fire Prevention, Fire-Escape Facilities and Building Construction:*

65. Should smoking in any part of the factory or manufacturing establishment during working hours be made a crime?

66. Should the use of wooden or non-fireproof partitions in any part of a factory or manufacturing establishment be prohibited?

67 *a.* What can be done to prevent spread of fire because of the inflammable material used in manufacture?

*b.* Should doors and sashes of windows leading to exits be painted red?

*c.* Should such sashes be of metal?

*d.* Should windows leading to fire-escapes be made of wired glass?

68. Should any change in the interior of a manufacturing establishment be permitted only after plans therefor have been filed and approved?

69. Should fire drills be made mandatory in all manufacturing establishments — how often?

70. Is it practicable to compel the installation of a so-called cooperative drill for the employees of different manufacturing establishments in the same building?

71. What plan would have to be adopted?

72. What value would separate and independent fire drills for different manufacturing establishments in one building have?

73. Should the installation of automatic sprinklers be made mandatory in all factories and manufacturing establishments?

74. Should the mandatory requirement of automatic sprinklers depend

(*a*) Upon the character of the industry? or

(*b*) Upon the number of persons employed in the establishment? or

(*c*) Upon the distance of the establishment above the street level? or

(d) Upon the height of the building in which the establishment is located irrespective of the number of employees in the particular establishment or its location?

75. In what factories or manufacturing establishments should the installation of an auxiliary fire-alarm system to warn the occupants of the building itself be made mandatory?

76. How can such a fire-alarm system be operated practically in a loft building with numerous independent establishments?

77. In what factories or manufacturing establishments should the installation of an automatic fire-alarm system to communicate with Fire Headquarters be made mandatory?

78. Should manufacturing be prohibited above a certain number of stories? What should be the maximum?

79. What should be the penalty for locked doors in a factory or manufacturing establishment while there are employees on the premises?

80. What measures would you recommend that would provide for the proper spacing of machinery? How wide should the clear passageway between machines be?

81. Should the law absolutely prohibit the use of any doors or shutters opening inwardly that lead to exits or fire-escapes?

82. Should the law prohibit the obstruction of the exit to fire-escapes by window sills?

83. Should outside fire-escapes be constructed at or about the floor level of the factory or manufacturing establishment in such a manner that no climbing over window sills would be necessary?

84. In all cases of outside fire-escapes should there be a standard of construction as in the Tenement House Law?

85. What kind of ladders or stairways would you recommend from the lowest balcony to the ground?

86. Should the number of people permitted to work in a factory be dependent upon the number and kind of exits provided?

87. Could such a provision be made specific or would it be left to the discretion of the responsible authority in each particular case?

88. Should every manufacturing establishment have a card posted showing the maximum number of people permitted to work in it?

89. Should factories and loft buildings be licensed for certain designated occupations and should changes in the nature of the occupancy be prohibited unless expressly authorized by the responsible authority?

90. Should stairways that wind around elevators be ordered removed in existing buildings?

91. Should existing elevator shafts be ordered enclosed in fire-proof walls?

92. Should existing stairways be ordered enclosed in fire-proof walls?

93. Should fire walls be ordered installed in existing buildings?

(a) In buildings 25 ft. x 80 ft.

(b) In buildings 50 ft. x 80 ft.

(c) In buildings 75 ft. x 80 ft.

94. Should fire towers be ordered in any existing buildings? In what kind?

95. What provisions would you recommend to secure adequate fire-escape exits in buildings to be constructed in the future?

96. What changes would you recommend in the present Building Code?

97. What criticisms have you to make of the recent Sullivan-Hoey law and what changes in that law would you recommend?

*Manufacturing in Tenement Houses:*

98 a. How should manufacturing in tenement houses be restricted?

b. To what extent are young children illegally employed in manufacturing conducted in tenement houses?

c. What measures should be adopted to prevent such employment?

*Industrial Commission:*

99 a. Should there be a permanent industrial commission appointed to work in conjunction with the State Department of Labor?

b. How should such commission be made up?

c. What should be its duties and powers?

*Continuation Schools for Minors Employed in Factories and Manufacturing Establishments:*

100 a. Do you advocate the establishment of continuation schools?

b. How should they be organized?

c. Between what ages should compulsory attendance in such schools be required?

d. What part of the day should be devoted to such schools?

*General Matters:*

101. What other suggestions of any kind have you that would tend to bring about a thorough and regular inspection of factories and manufacturing establishments and protect the health and safety of the operators therein?



102. Are you familiar with any conditions in factories and manufacturing establishments that you think would be of interest to the Commission or that should be investigated by the Commission?

*Note:*

Although many of the questions admit of a categorical answer it is hoped that your views and the reasons for the position you take will also be set forth. In answering, reference may be made to the numbers of the questions.

Dated New York, December 6th, 1911.

ROBERT F. WAGNER,

*Chairman.*

ABRAM I. ELKUS,

*Counsel.*

## **II. LIST OF PERSONS REPLYING TO QUESTIONNAIRE SUBMITTED BY THE COMMISSION**

Battle, George Gordon, Counselor-at-law.

Bensel, Walter, M. D., Sanitary Superintendent Department of Health, New York.

Callacy, G. B., Secretary Bakers' Union, Local.

Crocker, E. F., ex-Chief Fire Department, New York.

Davis, Gherardi A., Counselor-at-law, formerly Deputy Police Commissioner, New York.

De Forest, Robert W., formerly Tenement House Commissioner, New York.

Dix, S. M., Expert Accountant, Insurance.

Fox, E. F., Secretary International Moulders' Union, Local 246.

Ferguson, J. W., Contractor.

Freeman, J. R., Consulting Engineer, Board of Water Supply, New York.

Goler, George W., Dr., Health Officer, Rochester.

Grace, Charles, Legislative Agent, New York State Association of Journeymen Plumbers, etc.

Gray, J. P., President Boston Manufacturers' Mutual Fire Insurance Company.

Grossman, Herman, District Manager, Joint Board of the Cloak and Suit Makers' Union of New York.

Haight, A. S., Insurance Expert.

Hessler, H. E., Commissioner of Public Safety, Syracuse.

Hoffman, Frederick L., Statistician, President American Statistical Society.

Johnson, Joseph, Fire Commissioner, New York.

Kelley, Mrs. Florence, General Secretary, National Consumers' League.

Keyes, Charles H., Secretary of Committee on Safety, New York.

Knopf, S. Adolphus, Dr., physician, New York.

Leamy, J. J., Secretary International Boiler Makers and Iron Ship Builders, Local 197.

Lezinsky, Eugene L., General Manager, Cloak, Suit and Skirt Manufacturers' Protective Association, New York.

Loeb, Morris, Dr., New York, President Hebrew Technical Institute.

Low, Seth, Hon.

Marsh, Benjamin C.

Maxwell, William H., City Superintendent of Schools, New York.

Nathan, Mrs. Frederick, President New York Consumers' League.

O'Connor, D. W., Chairman Molders' State Legislative Conference.

Panken, Jacob, Attorney Garment Workers' Union, New York.

Parsons, H. DeB., Consulting Engineer.

Quarles, E. A., Secretary Model Safety Act Committee, National Civic Federation.

Quigley, J. P., Chief of Fire Depart., Syracuse.

Reagan, J. F., Superintendent Department Public Safety, Utica.

Rochester, Delancey, Dr., physician, Buffalo.

Sewall, W. G., New York.

Sherman, P. Tecumseh, ex-Commissioner New York State Department of Labor.

Smith, J. Waldo, Chief Engineer, Board of Water Supply, New York.

Sullivan, D. J., Chief Engineer, Department of Public Safety, Utica.

Tomlin, F. S., Secretary, Joint Legislative Labor Conference of Greater New York.

Wentworth, Franklin H., Secretary and Treasurer, National Fire Protection Association.

Wiley, Harvey W., Dr., Pure Food Commissioner.

Woolston, H. B., Prof., Department Political Science, College of City of New York.

Yates, Charles (Secretary, Central Labor and Trades Assembly of Syracuse), and Wood, E. V., Representative, Machinists' Union.

Yates, H. R., Chief of Fire Department, Schenectady.

### III. DIGEST OF REPLIES

#### JURISDICTION OVER FACTORIES AND MANUFACTURING ESTABLISHMENTS IN NEW YORK CITY.

*George Gordon Battle:*

I believe that there should be a Department of Labor for the city of New York and one for the rest of the State, and that there should be three commissioners at the head of each of these Departments.

A bureau of inspection should be established, such as is suggested.

A new department should be established in New York city to have exclusive jurisdiction over all factories and manufacturing establishments. I do not think that duplication of inspection is necessarily an evil, so long as each inspection is thorough. There is no danger of these inspections being so frequent as to become unduly burdensome, but danger might arise from divided responsibility attendant upon inspections by different Departments. The best way to centralize authority and responsibility for the enforcement of laws relating to factories is to make substantial violations criminal offences and to punish them by imprisonment. The present tendency of our Court of Special Sessions to punish infractions of statutes only by fines, is a great misfortune. As a result manufacturers feel that they are safe in violating the law and the most they have to fear is a fine, which they regard as in the nature of a license fee.

*Robert W. De Forest:*

I do not think there should be a separate Department of Labor for the city of New York. The unit of administration for this Department is the State. One policy should control all the cities of the State. For purposes of administration, New York city presents a unit so large as to require a resident official with large discretionary powers. He should be a deputy or assistant, or someone appointed to control by the State Commissioner of Labor.

The Tenement House Department in the city of New York has at the present time all the jurisdiction it can wisely exercise with the force and means now at its disposal. To enlarge its jurisdiction without enlarging its resources and personnel would only make it less possible than at present to enforce our tenement law.

The Bureau of Inspection, such as suggested in this question, should emphatically *not* be established. The duty of inspection and the duty of enforcing results of inspection should not be separated into different departments.

*S. N. Dix:*

There should be one State-wide Department and one Commission.

Neither the Board of Health nor the Tenement House Department should have jurisdiction over the bakeries, except as delegated by the State Commissioner of Labor

A Bureau of Inspection, such as is suggested, might be established, but it should use the city bureaus already existing for the details. A new Department should not be established for the city of New York, but the Commissioner of Labor should have authority to make city bureaus responsible and accountable to the State Department of Labor.

To centralize authority and responsibility for the enforcement of laws relating to factories, the State Commissioner should be made responsible, using the city bureaus as delegated authority.

*Herman Grossman:*

There should positively be a Department of Labor for the city of New York. There should be a Commissioner and a deputy at the head of this Department.

The Board of Health of New York city should have sole jurisdiction over bakeries in tenement houses. The Tenement House Department should have jurisdiction over all other manufacturing in tenement houses, exclusive of bakeries.

A separate Bureau of Inspection is absolutely unnecessary, but one Department should notify another in case its inspectors find violations that do not come within its jurisdiction.

I am in favor of establishing a new Department for the city of New York, with exclusive jurisdiction over all factories and manufacturing establishments.

*A. S. Haight:*

I think there should be a Department of Labor for the city of New York and one for the rest of the State.

A separate Bureau of Inspection should be established.

A new Department should be established for the city of New York, to have exclusive jurisdiction over all factories, unless the present Department can be made efficient. There should be a Department of labor established for the city of New York and one for the rest of the State.

*H. E. Hessler:*

I believe that a separate Bureau of Inspection should be established.

*Frederick L. Hoffman:*

I am inclined to favor the suggestion of one Department of Labor for the city of New York and one for the rest of the State, as it is in conformity with the principle adopted of the creation of two Public Service Commissions for the State of New York.

I am emphatically in favor of one Commissioner who should have sufficient discretionary powers to adapt himself successfully to the needs of a rather complex situation.

I am inclined to favor the suggestion that the Tenement House Department for the city of New York have sole jurisdiction over all manufacturing in tenement houses and over bakeries and confectionery establishments in tenement houses, since it will eliminate the duplication of inspection and reports, and place the sole responsibility where it seems properly to belong.

I approve of the suggestion for a separate Bureau of Industrial Inspection, which is in conformity to the recommendation of the Massachusetts Commission, and which would eliminate the evil of a multiform system of inspection, and subserve and centralize the executive functions concerned with the enforcement of the provisions of the law.

*Joseph Johnson:*

The Fire Department should have jurisdiction as to fire hazard in bakeries in tenement houses.

*Mrs. Florence Kelley:*

I do not believe that there should be a Department of Labor for the city of New York and one for the rest of the State. There is great need for uniform enforcement of the law throughout the State. The division of administrative Departments would make work more difficult. There should be one Commissioner for the whole State.

The Department of Health of New York city should not have sole jurisdiction over bakeries any more than it has sole jurisdiction over any other industry. It should have sole jurisdiction over sanitary conditions in the bakeries.

The Tenement House Department should not have sole jurisdiction over manufacturing in tenement houses and bakeries and confectionery establishments in tenement houses for the following reasons: Manufacture should not be carried on in tenement houses, nor should bakeries, which are a form of manufacturing, nor confectionery establishments, except, possibly shops exclusively for the sale of confectionery wares. The creation of such a Bureau of Inspection, as is here suggested, would be a mere duplication of administrative bodies. So far as labor is concerned it should be in the future, as it has been in the past, the duty of the State inspecting body to enforce the law.

A new department should not be established for the city of New York, as it is not desirable to duplicate or subdivide administrative bodies dealing with labor. The State Department of Labor should be given power, funds, personnel, equipment and authority to enforce the labor law throughout the State.

*Dr. S. Adolphus Knopf:*

I believe that there should be one State Department, but a special sub-bureau for New York city. There should be one head for the Department of Labor, with an advisory board consisting among others of the State Commissioner of Health.



The Board of Health in the city of New York should have sole jurisdiction over bakeries in tenement houses, including the supervision of confectionery establishments and every business which produces or handles food products.

The creation of a separate Bureau of Inspection would lead to useless multiplication of effort. Supreme power over this work should be vested in the Commissioner of Labor.

*Eugene L. Lezinsky:*

We heartily endorse a Department of Labor for the city of New York and believe in a single head for such a Department.

*Hon. Seth Low:*

I think there should not be a separate Department of Labor for the city of New York and another for the rest of the State. It seems to me much better that the Department should be one, while there might very well be two bureaus in the same Department. The experience in New York city ought to be serviceable to the other cities of the State, and *vice versa*. This sort of mutual benefit will be lost if there are two Departments.

I think it is necessary that the Departments of the city government should have authority everywhere in the line of their functions. I think that the Board of Health should have nothing to do with the question of labor in bakeries in tenement houses or elsewhere. In tenement houses, in view of the existence of the Tenement House Department, sanitary conditions in bakeries should be under the care of the Tenement House Department, while the event of the outbreak of disease in bakeries would come under the care of the Health Department. Outside the tenements, the Health Department should have entire sanitary jurisdiction.

I do not believe in the advantage of a second Bureau of Inspection. I think it would be a source of weakness and disadvantage. I do not believe in the creation of a new Department for the city of New York to have exclusive jurisdiction over all factories and manufacturing establishments other than those carried on in the tenement houses.

*Benjamin C. Marsh:*

There should be one Department of Labor in the State. There should be a Deputy Commissioner in New York city. There should be one Commissioner at the head of the Department of Labor.

There should not be any bakeries in tenement houses, but the Board of Health might properly have sole jurisdiction over bakeries as far as sanitary conditions are concerned, and not as to the hours of labor. Manufacturing in tenement houses should not be permitted. Pending prohibition the Board of Health should have jurisdiction as to sanitary conditions in manufacturing establishments in tenements, including bakeries and confectionery establishments.

A separate Bureau of Inspection is a useless duplication.

A new Department for the city of New York, to have exclusive jurisdiction over all factories, should not be established at present.

*Jacob Panken:*

New York city should have a Commission to have jurisdiction over workshops of every description. This Commission should be separate from the Factory Inspection Department and should be composed of the heads of the Tenement, Fire, Board of Health and Building Departments, plus one member to be appointed by the government.

*E. A. Quarles:*

A Department for the city of New York would be a good thing, but it should be under the authority of the State Commissioner of Labor. I am absolutely opposed to more than one person in authority at the head of any Department.

I do not think that a separate Bureau of Inspection should be established. The inspecting and enforcing power should be lodged in the same bureau.

A new Department should be established in the city of New York with the exception noted above, namely, that the New York city Department should be under the general direction of the State Commissioner of Labor.

*Dr. Delancey, Rochester:*

There should be a Department of Labor for the city of New York and one for the rest of the State, but there should be only one Commissioner.

A separate Bureau of Inspection should be established.

*P. Tecumseh Sherman:*

There should not be a Department of Labor for the city of New York and one for the rest of the State, and there should be only one Commissioner.

The Board of Health should not have sole or concurrent jurisdiction over bakeries in tenement houses and elsewhere. The Tenement House Department for the city of New York should not have sole jurisdiction over manufacturing in tenement houses and over bakeries and confectionery establishments in tenement houses.

There should most decidedly not be a separate Bureau of Inspection established.

A new Department for the city of New York should most decidedly not be established. There is no harmful duplication of inspection in New York city. What is desirable is to fix primary responsibility as between the different Departments. Jurisdiction over the original construction of buildings should be given to the Building Department. The Fire Department in New York city should have jurisdiction to make and enforce regulations of fire and escape of persons in case of fire. The Labor Department should have jurisdiction commensurate with its laws, except that the Fire Department should have primary responsibility for its laws.

*F. S. Tomlin:*

There should not be a Department of Labor for the city of New York and one for the rest of the State. There should be one Department of Labor and one Commissioner.

The Board of Health should not have sole jurisdiction over bakeries in tenement houses. The Department of Labor should take charge of all industries, including bakeries. Manufacturing in tenement houses should be absolutely prohibited, except on the

ground floor. Statutory provisions as to labor should be under the jurisdiction of the State Department of Labor.

A separate Bureau of Inspection should not be established. The Department of Labor should have charge over all factory inspectors.

A new Department should not be established for the City of New York. It would be a useless duplication of officials and consequent expense to an already tax-burdened people. To do away with duplication of inspections in the city of New York and to centralize authority and responsibility in the enforcement of the laws, I would suggest placing all inspection in charge of the Department of Labor.

*Charles A. Yates and Edward W. Wood:*

There should be no division of Departments, but as many Commissioners as are needed to get good results.

#### STATE LABOR LAW.

*Frederick L Hoffman:*

Without reflecting upon the efficiency of the State Bureau of Labor and Factory Inspection, I am of the opinion that the present system of inspection is inadequate. I am not prepared to say what the exact number of inspectors should be, or what proportion of the staff should consist of women inspectors, or what their respective technical qualifications should be. I believe, however, that the peculiarly congested condition of industry in the city of New York requires a larger pro rata inspection force than is at present the case. I may say in this connection that under date of April 1, 1908, an increase of thirty-five inspectors was authorized for the Department of Factory Inspection of Great Britain, raising the total number of inspectors and assistants to two hundred. The number of places under inspection in 1908 was 260,000 factories and workshops, apart from warehouses, docks, and other premises not technically factories or workshops, but within the scope of the factories acts for certain purposes.

I am of the opinion that at least four inspections should be made each year, but at irregular intervals and without the previous knowledge of the owner or supervising official of the establishment.

The services of inspectors with technical knowledge may be procured by holding out the inducement of continuity of service, reasonable hours of labor and adequate compensation. I am emphatically of the opinion that a high degree of technical ability is required for adequate and effective factory inspection, at least in the case of dangerous mechanical industries. A precedent for this point of view is found in the universal employment of highly trained technical factory inspectors and assistants in the German Empire, in connection with the carrying out of the rules for the prevention of accidents in German industries. Many of the most valuable suggestions for the installation of safety devices have been made by the technical supervising officials or inspectors and assistants, and so well established has become their employment that they have formed themselves into a national association.

By raising the standard of the inspection service to that of a profession, it will not be difficult to secure the right kind of men and women, who are graduates of engineering and other technical schools. It is a hopeless task to expect really valuable results from even the most earnest efforts of untrained inspectors, confronted by the often extremely technical conditions and requirements of modern industry. It would seem equally hopeless to expect that really efficient rules and regulations, framed for the protection of wage earners in dangerous or unhealthy trades, should issue from a technically unskilled inspectorial force.

*Herman Grossman:*

I believe we haven't enough inspectors to carry out the work. At the present time an inspector has a chance to visit a place only once or twice a year and this is not sufficient. Inspectors should be sent to places in seasonal trades when they are busy, and not, as often happens, in slack times. Frequency of inspection should be left to the judgment of the Commissioner with due regard to busy or slack times, and the number of inspections should vary with the character of the industry.

Violations should be sent direct from the office in order that immediate action can be taken. City Departments should work hand in hand with the State, and the heads of the different Departments should have meetings in order to devise ways and means of co-operation.

*Joseph Johnson:*

Manufacturing establishments should be inspected at least once a month, and the number of inspections should vary with the character of the industry.

In order to obtain the services of inspectors with technical knowledge, a civil service examination is necessary.

Violation orders should be sent direct to the violators and duplicate copies should be forwarded to Albany.

*Mrs. Florence Kelley:*

Frequency of inspection of manufacturing establishments depends largely upon the nature of the occupation and the sex and age of the employees. Where dangerous occupations are carried on inspections should obviously be frequent. Where women and children are employed in large numbers inspections should be correspondingly frequent.

The State Department of Labor should have inspectors enough to enforce all the provisions of the labor law. These provisions could probably be enforced with a reasonable degree of thoroughness by 200 inspectors for the city and 300 for the rest of the State, if manufacturing in city tenements were effectively abolished. Until that is abolished, no staff of inspectors, however large, can hope to enforce the law completely. The services of inspectors with technical knowledge can be obtained by providing for them in the labor law, by establishing rigid educational qualifications for candidates for these offices, arranging for graded increases of salary and retiring pensions.

Violation orders should be sent direct to the violator from the sub-offices of the Department of Labor, but the record should be kept in duplicate at the sub-office and also at Albany for the purpose of assuring prompt publication of reports.

The State Department of Labor should administer exclusively those provisions which deal with labor, that is, provisions relating to hours, children's working papers, machine guards, etc. Sanitary inspection of all kinds in all buildings is properly the function of the local health authorities and should be made mandatory.

*Charles H. Keyes:*

The present system of factory inspection, while administered with rare intelligence and scrupulous integrity, is yet not adequate. The Department is not provided with inspectors enough to make the frequent inspections necessary, especially of dangerous industries. It is difficult to say how often manufacturing establishments should be inspected. The character of the business, the stability of the process, the nature of its housing, all enter as determining elements. Inspections should take place so frequently to make sure that safe conditions are maintained.

It would be a mistake to reduce the number of inspections in manufacturing establishments. What is referred to as duplication of inspection by city Departments and the State Department of Labor is not, in fact, duplication. Just as in our homes we have inspectors to take the water meter, to determine the safety of the elevator, to pass upon the safety of the boiler, to read the gas meter, sanitary inspectors to examine the health appointments, police supervision and inspection, each for its own valuable end, so it is necessary, in order to maintain any high degree of safety, to increase rather than to decrease the number of inspections.

*Dr. S. Adolphus Knopf:*

The present system of factory inspection might be considered good if more men and more competent men could be designated to do the work. Frequency of inspection depends upon the character of the institution, the products manufactured and the promptness with which previously existing violations have been removed.

The head of the Department of Labor with his advisory committee is the only one who can answer the question of the number of inspectors necessary. The number of supervising inspectors should be determined by the number of inspectors and the size of the district.

Inducements to follow the career of factory inspector should be held out so as to make it a profession worth following. I would recommend that applicants who have successfully passed the civil service examination should, for a period of three months,

be assigned as assistants to inspectors having had some years of service. After that, the candidate should pass a practical examination to become eligible for appointment. A recommendation as to good character of the applicant by three reputable citizens should be required. All candidates should submit to medical examination to determine their physical and mental soundness. The position of factory inspector should be remunerative and secure enough to invite capable, responsible men to offer their services. After 25 years of faithful service they should receive one-half or two-thirds of their former salaries as a pension.

Minor violation orders may be given to the sub-bureau of each city in order to expedite the compliance with regulations. Minor offenses when not complied with as well as greater offenses, should be referred to the head office.

*Eugene L. Lezinsky:*

We believe that the present system of factory inspection is inadequate, an insufficient force of inspectors being undoubtedly the main reason. We understand that the factory inspector to-day inspects but from six to eight establishments in a day. Factories conducting a seasonal business should be inspected at the busiest time of the year. The fur industry has one busy season and the cloak and suit industry has two. We would recommend the grading of shops into three classes, a shop in grade A, for example, to require but one yearly inspection, others to be inspected several times each year in order to keep up the desired standards.

In regard to violation orders, we believe the factory inspector should file a copy of his report with his own Department and other copies with the Bureau of Fire Prevention and also the Health Department, in order to insure the placing of the responsibility where it belongs.

*Benjamin C. Marsh:*

I regard the present system of factory inspection as inadequate. Manufacturing establishments should be inspected at least twice a year. The number of inspections per year should depend upon the character of the industry. There should be at least 300



inspectors for New York State — 200 for New York city and 100 for the rest of the State. There should be ten supervising inspectors. The services of inspectors with technical knowledge can be secured by training men and paying them ample salaries.

The respective spheres and functions of city Departments and of the State Department of Labor should be more clearly defined, and so far as possible the work of enforcing factory laws left to the State Department of Labor, as that of enforcing building ordinances for the city Department.

*Mrs. Frederick Nathan:*

I regard the present system of factory inspection as adequate, but there is not a large enough force of inspectors. Manufacturing establishments should be inspected four times a year at irregular intervals, dangerous and seasonal trades more frequently.

The services of inspectors with technical knowledge can be procured through civil service examinations framed for the purpose of bringing out such special technical knowledge.

*Jacob Panken:*

Factory inspection in New York city is not adequate. The force of inspectors in the service of the Department in New York is absolutely insufficient to properly inspect the factories, shops and stores. Factories, shops and stores should be inspected bi-monthly. In places where great numbers of people are employed the inspections should be more frequent.

In order to procure the services of inspectors with technical knowledge, I believe that inspectors should be qualified in two grades: one, inspectors in the employ of the State, receiving pay for their services; two, a voluntary corps of inspectors.

Violation notices should be sent to the violator direct from the sub-office requiring him immediately to remove the violation. Upon failure to comply within the time specified in the notice, a notice shall be posted on the door of the shop, factory or store prohibiting the use of the premises as a workshop, factory or store.

*E. A. Quarles:*

The present system of factory inspection is not adequate, but I think the Department is doing the best it can under the circumstances. There should be no hard-and-fast rule as to the number of times a factory should be inspected. Generally speaking, however, I think it would be well to have every factory inspected at least once a year. The number of inspections should depend not only upon the character of the industry, but upon the history and conditions in the individual plant.

The services of inspectors with technical knowledge can be secured by paying adequate salaries and observing rigid civil service requirements.

I believe that minor violation orders should be sent direct to the violator.

*Dr. Delancy Rochester:*

From the results, I should judge that the present system of factory inspection was not adequate. Manufacturing establishments should be inspected at least four times a year. The number of yearly inspections should depend upon the character of the industry. Inspectors with technical knowledge can be procured by payment of a sufficient salary, with the knowledge that they cannot be ousted for political purposes. The sub-office of the Department of Labor should send its violation orders direct to the violator.

*P. Tecumseh Sherman:*

I believe that the present system of factory inspection will be adequate when arrears are dealt with, etc. Manufacturing establishments should be inspected once a year for statistical purposes. How much oftener depends upon many purposes and conditions. There should be about 100 factory inspectors for New York State, three-fifths in New York city and two-fifths in the rest of the State. Those in the country should serve some winter months in the city. Inspectors with technical knowledge can be procured by payment of adequate salaries and through civil service examination. The method of sending violation orders is a matter of administration which should not be fixed by law.

*F. S. Tomlin:*

The present system of factory inspection is decidedly not adequate. Manufacturing establishments should be inspected once in six months. The number of inspections yearly should depend upon the character of those who carry on the business. There should be 300 factory inspectors for New York State, 175 for New York city and 125 for the rest of the State. There should be 15 supervising inspectors. Technical inspectors are not needed. They are like expert witnesses, impractical, misleading, wasteful and useless. Violation orders should be sent direct from the sub-office.

*Charles Yates and Edward V. Wood:*

The present system of factory inspection is not adequate. Manufacturing establishments should be inspected at least once a month and oftener if possible, since new conditions arise every day. The number of inspections should not depend on the character of the industry. There should be as many factory inspectors in New York State as are necessary. We would suggest one for each Assembly district. There should be at least one supervising inspector in every city of over 50,000 inhabitants. Inspectors with technical knowledge can be secured by appointing tradesmen to investigate shops of their craft. Violation orders should be sent from the sub-office direct.

## MUSEUM OF SAFETY.

*Robert W. DeForest:*

I think the Labor Department could wisely publish and circulate a list and description of safety devices. The cost of this is small compared with the gain.

*S. M. Dix:*

I believe that Labor Department should publish a list and description of safety devices in the various trades, and a description of them.

*Dr. George W. Goler:*

There should be a Museum of Safety established with traveling exhibits, and the expense thereof ought to be borne by the State. The State Department of Labor should publish, from time to time, bulletins describing the newer devices, and the old and current dangers.

*Frederick L. Hoffman:*

The Labor Department should publish and circulate from time to time a list and description of safety devices in the various trades and industries. This suggestion follows the long-established precedent in the practice of German compulsory accident insurance institutions, which, in the annual reports of the technical inspectors, publish illustrations of the latest discoveries in the ever-expanding field of safety devices. It would serve a much more useful purpose if the Labor Department were to give the widest publicity to facts of this kind, than to enlarge upon the field of elaborate statistical publications, which, without the advantage of a thoroughly qualified critical analysis, often serve no practical purpose whatever.

*Mrs. Florence Kelley:*

There should be a Museum of Safety as a branch of the State Department of Labor, not as a private institution endowed by the State. It is essential to the efficiency of the State Department of Labor. It might be made of great value to employers desiring to improve their establishments. It is of the utmost importance that the State should, from time to time, publish and circulate lists, descriptions, drawings and pictures of safety devices. In no other way can the work of the inspectors be standardized, and employers assured of the uniformity of expense, and employees assured of uniform safety in relation to a given industry.

*Dr. S. Adolphus Knopf:*

A Museum of Safety should certainly be established, but the already existing private institution, if aided by the State, would answer the purpose. The State Department of Labor should by all means publish lists and descriptions of safety devices. I

would even suggest that the function of the Museum of Safety be enlarged by establishing a course of lectures to popularize the ways and means whereby industrial accidents can be avoided.

*Dr. Morris Loeb:*

The American Museum of Natural History should be urged to set aside a particular space for a Museum of Safety. Such a Museum could only be effectively maintained by private corporation.

*Benjamin C. Marsh:*

There should be a Museum of Safety established, and the safety of people in offices, as well as in factories, should be considered. Hence, the Museum of Safety should be under the charge of a separate department, not the Department of Labor. The Department of Labor should publish and circulate a list and description of safety devices.

*E. A. Quarles:*

A Museum of Safety should be established as a branch of the State Labor Department. I believe the Department of Labor should circulate a list and description of safety devices.

*Dr. Delancey Rochester:*

A Museum of Safety should be established as a private institution, endowed by the State. The Department of Labor should publish a list and description of safety devices.

*P. Tecumseh Sherman:*

A Museum of Safety should be established as a private institution, endowed by the State, unless the Federal government will establish one. The Department of Labor should publish such a list as that suggested, and also a description of safety "practices."

*F. S. Tomlin:*

A Museum of Safety should be established under the State Labor Department. If the State Department of Labor published

and circulated a list and description of safety devices, I think the undertaking would do much good.

*Charles Yates and Edward V. Wood:*

A Museum of Safety should be established under the State Labor Department. The Department of Labor should publish a list and description of safety devices.

### MEDICAL INSPECTION.

*S. M. Dix:*

There should not be a Division of Medical Inspection in the State Department of Labor. The functions of such a department should be performed by local Boards of Health, responsible in such matters to the State Commissioner.

*Dr. George W. Goler:*

I doubt very much if there should be a Division of Medical Inspection in the State Department of Labor, or whether there should be a Board of Medical Advisers. But that there should be a board of advisers, some of whom should be sanitarians and hygienists, I think there can be no doubt.

*Herman Grossman:*

I think there should be a Division of Medical Inspection in the State Labor Department, and also a Board of Medical Advisers to the State Commissioner of Labor.

*A. S. Haight:*

There should be a Division of Medical Inspection in the State Labor Department.

*Joseph Johnson:*

There should be a Division of Medical Inspection in the State Labor Department.

*Mrs. Florence Kelley:*

There should be a Division of Medical Inspection in the State Labor Department. The work of Dr. Rogers, viewed as a beginning, indicates the very great need of an increase in this direction.

*Charles H. Keyes:*

It is manifestly impossible to discharge the sanitary responsibilities devolving upon the State Department of Labor without a Division of Medical Inspection.

*Dr. S. Adolphus Knopf:*

If medical inspection of every laborer is meant, a practice in vogue in Germany, it would seem a physical impossibility to do it with the present equipment of any of the existing State Departments. The work belongs by right to a State Insurance for Accidents and Diseases. If the creation of a division having to deal with purely medical questions of the Department is meant, I think it would be expedient. I certainly would deem it expedient to have a Board of Medical Advisers to the State Commissioner of Labor appointed by the Governor.

*Benjamin C. Marsh:*

I think there should not be a Division of Medical Inspection in the State Labor Department. The city health authorities charged with the duty of conserving the health of the city should make medical inspections, although the frequency of such inspections and the general nature might properly be determined by the State Department of Labor.

*Mrs. Frederick Nathan:*

There should be a Division of Medical Inspection in the State Labor Department, and it should be authorized and equipped to study industrial diseases and safety devices to prevent accidents.

*E. A. Quarles:*

There should be a Division of Medical Inspection in the State Labor Department.

*Dr. Delancey Rochester:*

There should be both a Division of Medical Inspection in the State Labor Department, and a Board of Medical Advisers to the State Commissioner of Labor.

*P. Tecumseh Sherman:*

There need not be a separate Division of Medical Inspection in the State Department of Labor, but there should be a Board of Medical Advisers to the Commissioner.

*Charles Yates and Edward V. Wood:*

There should be both a Division of Medical Inspection in the State Labor Department and a Board of Medical Advisers to the State Commissioner of Labor.

## POWER OF COMMISSIONER TO MAKE RULES AND REGULATIONS.

*Robert W. DeForest:*

I think the Commissioner of Labor should be given power to make rules and regulations to cover accident prevention and proper sanitation in different industries. I think the best results would be obtained by having the Commissioner appoint an advisory board of technical experts to formulate these rules and regulations, whom he could call on from time to time for advice.

*S. M. Dix:*

The Commissioner of Labor should be given power to make rules and regulations to cover accident prevention and proper sanitation in different industries.

*Dr. George W. Goler:*

The Commissioner of Labor should be given power to make rules and regulations relating to the prevention of accidents and the sanitation of all industries. These rules should, of course, be made under the advice of a board of experts.



*Herman Grossman:*

I think the Commissioner of Labor should be given the power to make rules and regulations to cover accident prevention and proper sanitation in different industries.

*A. S. Haight:*

Power should be given to the Commissioner of Labor to make rules and regulations to cover accident prevention and proper sanitation in different industries.

*Joseph Johnson:*

I believe the Commissioner of Labor should be given the power to make rules and regulations to cover accident prevention and proper sanitation.

*Mrs. Florence Kelley:*

Power should be conferred upon the Commissioner of Labor to make rules and regulations for the prevention of accidents. Sanitation, however, is the function of the State and local health officials and should be left to them. It is not desirable at the present time that a board of technical experts should be appointed by the Governor to advise the Commissioner.

*Charles H. Keyes:*

The Commissioner of Labor should certainly be given power to make rules and regulations to cover accident prevention and proper sanitation in different industries.

*Dr. S. Adolphus Knopf:*

In conjunction with an advisory board, the Commissioner of Labor should be given the power to make rules and regulations to cover accident prevention and proper sanitation in different industries.

As a part of the advisory board, there should be a board of technical experts appointed by the Governor to advise the Commissioner in the formulation of rules and regulations and their revision from time to time.

*Eugene L. Lezinsky:*

We are in favor of the Commissioner of Labor being given the power to make rules and regulations to cover accident prevention and proper sanitation. Although we recognize the great difficulties involved, we believe such power of the Commissioner to be in line with modern standards.

*Benjamin C. Marsh:*

I believe the Commissioner of Labor should be given power to make rules and regulations to cover accident prevention and proper sanitation, with the proviso that the minimum requirements should be determined by State legislation. There should be a board of technical experts appointed by the Governor to advise the Commissioner.

*Mrs. Frederick Nathan:*

I believe, emphatically, that the Commissioner of Labor should be given the power to make rules and regulations to cover accident prevention and proper sanitation in different industries. It is not necessary to have a paid board of technical experts to advise the Commissioner. Expert advice can always be had.

*Jacob Panken:*

The Commissioner should have the power to make rules and regulations, but such rules and regulations shall be submitted to the Court of Appeals of the State to be passed upon immediately after the rules and regulations are made, so that the legality and constitutionality of same may be determined forthwith.

*E. A. Quarles:*

The Commissioner of Labor should be empowered to make rules and regulations by and with the consent and advice of a board of technical experts appointed by the Governor. The Commissioner only, however, should be clothed with authority to initiate rules and regulations.

*Dr. Delancey Rochester:*

I think the Commissioner of Labor should be given the power to make rules and regulations to cover accident prevention and proper sanitation, and there should be a board of technical experts appointed by the Governor to advise the Commissioner in the formation of rules and regulations and their revision.

*P. Tecumseh Sherman:*

The Commissioner of Labor should not be given the power to make rules and regulations to cover accident prevention and proper sanitation in different industries. There should be a board of technical experts appointed by the Governor to advise the Commissioner in the formulation of rules and regulations, those rules to be amended solely upon motion of the Commissioner of Labor.

*F. S. Tomlin:*

I am of the opinion the Commissioner of Labor should be given power to make rules and regulations covering accident prevention and proper sanitation. I do not think there should be a board of technical experts appointed to advise the Commissioner in the formulation of these rules and regulations and their revision. The Commissioner should have authority to consult with experts if he chooses, and they should be paid by the State.

*Charles Yates and Edward V. Wood:*

The Commissioner of Labor should be given the power to make rules and regulations to cover accident prevention and proper sanitation. There should be a board of technical experts appointed by the Governor to advise the Commissioner in the formulation of these rules and regulations and their revision from time to time.

## PENALTIES FOR VIOLATION OF LAW.

*Robert W. DeForest:*

I think if one or more courts were set aside for the enforcement of the Labor Law, the Tenement Law and the like, so that the

trial judge would be thoroughly familiar with this specialty of law, enforcement would be far more effective.

*Herman Grossman:*

Absolute power should be given the Commissioner of Labor in order to enforce the law. I would recommend a heavy fine, imprisonment, or both, as measures to bring about a more speedy and effective punishment for violations of the provisions of the Labor Law.

*A. S. Haight:*

If an employer neglects his employees, shut his factory until he does as required.

*Joseph Johnson:*

Power should be given the Commissioner of Labor to close a factory. Make violation a misdemeanor and get prison sentences as well as penalties.

*Mrs. Florence Kelley:*

Power should be given to the Commissioner of Labor for summary enforcement of the provisions of the Labor Law by closing the establishment whenever, in his opinion, persistent violation of the law threatens life or limb of employees.

*Dr. S. Adolphus Knopf:*

The Commissioner of Labor should be given power for the publication or placarding of violations until they are removed.

*Benjamin C. Marsh:*

Any person attempting to prevent the speedy and effective punishment for violations of provisions of the Labor Law should be guilty of a misdemeanor. The prosecuting officers should have a little more nerve, while magistrates and judges who fail to enforce the law should be made liable thereby to removal.

*Mrs. Frederick Nathan:*

The Commissioner of Labor should be given power to force eviction from premises until the law can be complied with.

*Jacob Panken:*

If punishment is to be meted out, it should be severe if it is to have any effect at all. I believe that it is possible to grade the violations in such a manner that some shall be made felonious, while others are ordinary misdemeanors.

*Dr. Delancey Rochester:*

Summary power to enforce the Labor Law should be given to the Commissioner.

*P. Tecumseh Sherman:*

The Commissioner of Labor should be given power to enjoin for violation of regulations. In order to bring about a more speedy and effective punishment for violation of the provisions of the Labor Law, I would recommend that magistrates be deprived of the power to suspend judgment for fines and to dismiss for compliance with the law after prosecution has been begun.

*Charles Yates and Edward V. Wood:*

The Commissioner of Labor should be made the prosecuting authority rather than shift responsibility to an officer, board or commission having charge of the work. In order to bring about more speedy and effective punishment for violations of the Labor Law, more competent and intelligent inspection should be had, employers not to be notified when inspection is to be made.

## REGISTRATION AND LICENSING OF FACTORIES.

*Robert W. DeForest:*

There should be a compulsory system of registration of all factories and manufacturing establishments in the State.

*Frederick L. Hoffman:*

I am strongly in favor of a compulsory system of registration of all factories. This goes to the root of the whole problem of effective and complete factory supervision and industrial inspection, exclusive of the supervision and control of manufacturing in tenement houses and the bakeries and confectionery establishments carried on therein.

The suggestion that plans be filed showing the location of machinery, partitions, etc., and such plans be approved before any new factory or manufacturing establishment is operated, is an excellent one. This is in entire conformity to the principle long since adopted by several Continental European States, and to which is largely due the fact that modern factory construction on the Continent is, generally speaking, of a very high order. The same principle which applies to tenement and other building construction applies with even greater force to factory construction, and it is not going too far to say that many old-time evils have been reproduced in modern plants by a simple disregard of well-known elements of safety and sanitation. I cannot make my recommendation too emphatic that the principle of previous official approval of plans for factory construction should be embodied in any new factory legislation enacted by the State of New York.

I favor the requirement of a license for all factories and manufacturing establishments, and would suggest that such a license should be made revokable in the event of non-compliance with the factory and sanitary laws. I would not favor any exceptions whatsoever, except, of course, that the law should specifically define a factory or manufacturing establishment within the scope of the labor laws.

*Mrs. Florence Kelley:*

There should be a compulsory system of registration with the Labor Department of all factories and manufacturing establishments in the State. Plans should be filed showing the location of machinery, partitions, etc.; and such plans should be approved before any new factory or manufacturing establishment is operated. The location of the factory with regard to light, ventilation and congestion of population should all be taken into considera-

tion before the granting of the licenses. A license should be required for all factories and manufacturing establishments hereafter established.

*Charles H. Keyes:*

We shall never have safe and sanitary conditions in factories and manufacturing establishments until all these places are required to register, and such registration should be valid only for the prosecution of the particular business seeking the license. Change of either business or location should call for new registration or at least for transfer of the registration. The location of partitions, and certainly the location of heavy or dangerous machinery, constitutes essential parts of the hazard, and plans showing their location should certainly be in hand before the registration and license of the factory should take place. We should insist upon the licensing of all factories and manufacturing establishments.

*Dr. S. Adolphus Knopf:*

I believe there should be a compulsory system of registration of all factories in the State, and that plans should be filed showing the location of machinery, etc., such plans to be approved before any new factory is operated. It would seem that registration would suffice for all practical purposes except in cases where the manufacturing method might constitute a nuisance or might be designated as a dangerous trade.

*Benjamin C. Marsh:*

There should be a compulsory system of registration of all factories, and the names of the actual owners of factories and of the owners of buildings in which such factories are located, with their addresses, should be registered. Plans should be filed showing the location of machinery, partitions, etc., and such plans approved before any new manufacturing establishment is operated, while in addition plans of existing factories should be made to show the need for changes in arrangement. A license should be required in all cases for factories.

*Mrs. Frederick Nathan:*

I believe there should be a compulsory system of registration of all factories. Plans should be filed showing the location of machinery, etc., and such plans approved before any new factory is operated, and when change of occupancy occurs, a new license should be required. A license should be required. Some occupations are more dangerous than others, some require more employees than others.

*E. A. Quarles:*

Without a doubt there should be a compulsory system of registration of all factories, and plans should be filed showing the location of machinery, etc., and such plans approved before any new factory is operated.

*Dr. Delancey Rochester:*

I am of the opinion that there should be a compulsory system of registration of all factories. Plans showing the location of machinery, etc., should be filed, and such plans approved before any new factory is operated.

*P. Tecumseh Sherman:*

I think there should be a compulsory system of registration of all factories, but it will take a long time and a good deal of hard work to get it into effect. Plans need not be filed showing the location of machinery, partitions, etc., and such plans approved before any new factory or manufacturing establishment is operated. A license should not be required for all factories, but such license should be required for factories in tenant factory buildings and more particularly for those above the third floor.

*F. S. Tomlin:*

Without a doubt, in all cases, there should be a compulsory system of registration of all factories in the State. Plans should be filed showing the location of machinery, etc., and such plans approved before any new manufacturing establishment is operated. A license should be required.



*Charles Yates and Edward V. Wood:*

I believe there should be a compulsory system of registration of all factories. Plans should be filed showing the location of machinery, and such plans approved before any new factory is operated. A license should be required.

### WATER CLOSETS.

*J. B. Callacy:*

There should be two toilets for every 25 persons employed.

*S. M. Dix:*

There should be a provision in the law specifying the number of toilets to be installed.

*Dr. George W. Goler:*

One toilet should be required for each 20 or 25 persons.

*Herman Grossman:*

There should be a provision in the law specifying the number of toilets to be installed. For 25 persons three will be sufficient.

*A. S. Haight:*

There should be a provision in the law specifying the number of toilets to be installed.

*H. E. Hessler:*

I think there should be a provision in the law specifying the number of toilets to be installed.

*Joseph Johnson:*

There should be at least two toilets required for each 25 persons employed.

*Mrs. Florence Kelley:*

It is not enough to prescribe the number of toilets. Distribution for accessibility and decency is also highly important.

*Dr. S. Adolphus Knopf:*

There should be one toilet required for about 20 to 25 persons, but separate toilets for each sex.

*Benjamin C. Marsh:*

There should be a provision in the law specifying the number of toilets to be installed, and one should be provided for every ten people.

*Dr. Delancey Rochester:*

Two toilets for each 25 persons employed should be sufficient.

*P. Tecumseh Sherman:*

The question of how many toilets should be required for each 25 persons employed should be left to the board of medical advisers.

*F. S. Tomlin:*

One toilet should be required for 25 persons.

*Charles Yates and Edward V. Wood:*

We think there should be a provision in the law specifying the number of toilets to be installed.

## REMOVAL OF DUST, GASES AND FUMES.

*S. M. Dix:*

Such methods as have been developed by the best modern practice should be adopted for the removal of gases and fumes.

*Dr. George W. Goler:*

All sweeping and dusting in factories should be done by pneumatic sweepers.

*Herman Grossman:*

If garments are manufactured they should be covered, and these covers should be washed occasionally, and in other factories, where iron or boards are used, it should be up to the management to see that the place is cleaned so that dust cannot accumulate.

*Joseph Johnson:*

In order to remove gases and fumes, blowers with exhausts to open air or combustion chamber should be adopted.

*Dr. S. Adolphus Knopf:*

The well-known specific mechanical devices in use in all modernly-equipped factories should be used for the removal of gases and fumes.

*Mrs. Frederick Nathan:*

Hoods to carry away fumes and dust should be used.

*Dr. Delancey Rochester:*

The manufacturer or owner of the plant should be compelled to furnish proper respirators for his employees and see that these respirators are used.

*P. Tecumseh Sherman:*

What measures should be adopted for the removal of gases and fumes should be left to the board of medical advisers.

## VENTILATION.

*S. M. Dix:*

There should be a standard of ventilation. What the standard of ventilation should be, how many cubic feet of air space should be allowed in the daytime, or when gas or electric light is used for lighting, how many cubic feet of air space per person in the

night-time, and when mechanical ventilation should be made mandatory, are matters which depend on conditions as developed by experience. The number of persons employed should be varied by conditions of service and business. Standards should all be based on practical experience tables under varying conditions of the several industries.

*Dr. George W. Goler:*

There should be a standard of ventilation and also a standard of moisture; and, as a measure of economy to the factory as well as a provision for the health of the workers, there should be at least 600 cubic feet of air space to each person, and when gas is used for lighting purposes this should be doubled. A similar doubling of air space should be provided for persons who work in the night. All factories should be required to have mechanical systems of ventilation, whereby at least 3,000 feet of fresh, screened, moistened air per hour should be provided for each worker. Of course, there should not only be a standard of temperature at 68 degrees five feet from the floor, but there should also be a standard of moisture which should not be less than 30 per cent in zero weather.

*Herman Grossman:*

There should be a standard of ventilation. This should be by open windows and electric fans. According to my judgment when gas and electric lights are used, naturally the atmosphere is stronger than in the day, and it would require stronger ventilation to be used than in the daytime. Therefore, electric fans should be used besides the open windows. Mechanical ventilation should be made mandatory when the air becomes unbearable. The number of persons employed should be limited in proportion to the floor area. The standard should be the same as the law provides, but the manufacturers have not lived up to it. The law department should see that it is enforced absolutely. This should be referred to the Board of Medical Experts.

*A. S. Haight:*

There should be a standard of ventilation. Mechanical ventilation should be made mandatory when needed. The number of persons employed should be limited in proportion to the floor area.

*H. E. Hessler:*

The number of persons employed should be in proportion to the floor area.

*Joseph Johnson:*

There should be a standard of ventilation. The standard should be such as would assure wholesome air. Mechanical ventilation should be made mandatory when natural conditions are insufficient. The number of persons employed should be limited in proportion to the floor area, to be determined by the class of work.

*Charles H. Keyes:*

The whole matter of ventilation is of the utmost importance and can readily be standardized. There is a reasonably generous agreement among sanitary engineers as to the quantity and quality of air needed to maintain human efficiency,—the actual delivery of 20 cubic feet of pure air per minute per person, this air not to be baked or deprived of the necessary moisture nor overheated. This delivery of fresh air is, of course, only possible where means are provided for carrying off the vitiated air. Where the pure air is vitiated by other than human agencies there should be added a sufficient volume of fresh air to provide for such vitiation. Mechanical ventilation should be made mandatory wherever it is probable that otherwise it is impossible to insure the elimination of vitiated air and the delivery of the standard minimum of fresh air per person for every minute of time.

Because in many establishments the windows must be depended upon for ventilation it is important to limit the number of persons employed on any given floor area,—this for two purposes; first, it will determine the available number of cubic feet of air per person, and second, it will limit the load that can safely be

imposed upon the floor structure. It is most important to note that the inmates of factories and manufacturing establishments suffer from overheating a hundred times where evil consequences result from underheating once. The standard will vary with the character of the work to be done.

*Dr. M. Loeb:*

The law with regard to ventilation should be entirely redrawn under conditions which would determine the maximum of toleration with regard to percentage of carbon dioxide, sulphur dioxide and other noxious gases, as well as the suspended solids. In view of the peculiarities of ventilation, whether artificial or natural, a cubic air allowance has no value whatsoever; an alcove outside of the regular currents of ventilation might complete the prescribed number of cubic feet without being good for anything. On the other hand, the floor area seems to me of maximum importance, and a formula should be adopted in which the free area — that is, the space available for circulation — of rooms containing fixed machinery should be greater than of those in which only movable furniture is contained.

*Benjamin C. Marsh:*

There should be a standard of ventilation. A complete renewal should be provided for at least six times an hour. 500 cubic feet is the minimum which should be required where either gas or electric lights are used, preferably 600 where gas is used. There should be placards in every room stating in such language or languages as the Commissioner of Labor deems necessary, the number of occupants permitted in the room. 600 cubic feet of air space per person should be the minimum in the night-time. Mechanical ventilation should be made mandatory within a year at longest if the question of time is involved; and should be required where natural ventilation cannot be made satisfactory. The number of person employed should be limited so as to provide adequate aisles and accessibility to fire-escapes. The standard is a question for medical experts to determine.

The number of persons employed should be limited in proportion to the floor area.

*Dr. Delancey Rochester:*

Whether there should be a standard of ventilation, what that standard should be, how many cubic feet of air space per person should be allowed in the daytime, when gas or electric light is used, and in the night-time, are questions best answered by sanitary experts. Most of our houses, places of business and factories are overheated and too dry. There should be a properly constructed humidifier and the temperature should be kept between 60 and 65 degrees F. during the winter, and if possible to accomplish, it should not be allowed to rise above 80 degrees F. in the summer.

*P. Tecumseh Sherman:*

There should be a standard of ventilation. What this standard should be, how many cubic feet of air space per person in the daytime, should be allowed, how many when gas is used for lighting purposes, how many when electric lights are used, and how many in the night-time, and when mechanical ventilation should be made mandatory, are questions to be left to the board of medical advisers.

*F. S. Tomlin:*

There should be a standard of ventilation. A free circulation of air should be maintained when there are windows on opposite sides of a room. I am of opinion this can be accomplished without mechanical means. Four hundred cubic feet of air space per person should be allowed in the daytime; 500 cubic feet in the night-time. Mechanical ventilation should be made mandatory whenever a free circulation of air cannot be maintained without it.

There should be 25 square feet of floor space for each person exclusive of machinery. The standard of temperature should be 60 to 65 degrees Fahrenheit.

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*Charles Yates and Edward V. Wood:*

There should be a recognized standard of ventilation. The number of persons employed should be limited in proportion to the

floor area. This question can be best answered by a physician or health officer.

### EATING MEALS IN WORKROOMS.

*Herman Grossman:*

The eating of meals in workshops should be prohibited generally. Clothing industries, shoe factories, hair shops, fur factories and all wearing apparel,—these factories in particular should have a separate dining room.

*A. S. Haight:*

The eating of meals in workshops should not necessarily be prohibited generally.

*Joseph Johnson:*

Wherever practicable, the eating of meals in workshops should be prohibited.

*Mrs. Florence Kelley:*

Eating meals in workshops should be prohibited generally. It should be obligatory upon the employer to provide a clean, wholesome and suitable place for meals.

*Charles H. Keyes:*

It is imperative that eating meals in workshops should be prohibited in industries dealing with unsanitary or poisonous materials or processes. Where large numbers of employees are found, particularly where women constitute the large body of the operatives, employers would probably make money through the increase of efficiency among operatives if wholesome, sanitary luncheon rooms were provided.

*Dr. S. Adolphus Knopf:*

Eating in workshops can never be considered sanitary in any industry. Washrooms should be provided to enable the workers



to clean hands and faces before touching food. Individual drinking cups or sanitary drinking fountains should be made obligatory.

*Dr. M. Loeb:*

The prohibition of the eating of meals in workshops is desirable in all the chemical industries, and in painters', plumbers' and other shops involving the use of poisonous metals, but it would seem to me that this could only be enforced satisfactorily if separate eating rooms must be provided wherever the number of employees in such industry exceeds a given amount; such rooms should have the prescribed amount of washing facilities.

*Benjamin C. Marsh:*

Eating meals in workshops should not be prohibited generally unless proprietors are going to furnish lunch money above the regular wages or the state wants to enrich the saloon keepers. In what specific industries it should be prohibited is a technical question to be determined by physicians. If a general prohibition is impossible, manufacturers can probably be induced or possibly might be required to provide eating rooms.

*Mrs. Frederick Nathan:*

The eating of meals in workshops should be prohibited generally, especially where work produces dust or fumes from gases.

*Dr. Delancey Rochester:*

The eating of meals in workshops should be allowed under no circumstances.

*P. Tecumseh Sherman:*

Eating meals in workshops should not be prohibited generally. The question of the specific industries in which it should be prohibited should be referred to the board of medical advisers.

*F. S. Tomlin:*

In general, meals are better eaten in a room other than where work of any kind is carried on. It should be prohibited in all

paint and other manufactories where lead, arsenic, mercury, phosphorus or any other kind of poison is used, and in metal polishing and other industries which create dust of any kind.

*Charles Yates and Edward V. Wood:*

The eating of meals in workshops should be prohibited in all cases, unless a special room is provided for that purpose.

### LIGHTING FACILITIES.

*Herman Grossman:*

I would not permit people to work in dark places, but if it is inevitable, electric lights should be used with shades so as not to hurt the eyes.

*Joseph Johnson:*

The standard of intensity and brilliancy of light varies with the work.

*Dr. S. Adolphus Knopf:*

While the questions as to what measures should be taken to improve artificial lighting facilities in factories, and what the standard of intensity and brilliancy of light should be, could, perhaps, best be answered by an expert, my personal opinion is that daylight and electric lights are superior to all other methods of illumination.

*Benjamin C. Marsh:*

The question of lighting is a technical one on which I can only suggest that no factory should hereafter be constructed so that any part of a workshop is over 28 or 30 feet from a window in a wall at a distance, at least, from the opposite wall, of one-fourth of the height from the ground to the floor.

*P. Tecumseh Sherman:*

The question of artificial lighting facilities and as to the standard of intensity and brilliancy of light should be left to the board of technical experts.

*F. S. Tomlin:*

I am of opinion that employers would find it profitable to have their workrooms well lighted. The light should be diffused so that all parts of the room would be lighted so that a person of normal vision could read ordinary newspaper print without straining, two feet from the eyes.

*Charles Yates and Edward V. Wood:*

As to what measures should be taken to improve artificial lighting facilities in factories and manufacturing establishments, expert advice should be secured. There should be a standard of intensity and brilliancy of light.

## ACCIDENT PREVENTION.

*Herman Grossman:*

There should surely be a provision making it mandatory to maintain lights in front of all elevator openings. This will prevent accidents. To prevent elevator accidents, I would recommend that the entrance should be barred with gates, and rules should be made for the elevator men not to open the gate until the car is brought to a standstill. Another rule allowing only a certain number of people in a car should be made, and this will prevent accidents that occur from a car being overfull.

*A. S. Haight:*

There should surely be a provision making it mandatory to maintain lights in front of all elevator openings. I would recommend the use of automatic gates with attendants to operate them, as a means of preventing elevator accidents.

*H. E. Hessler:*

There should be a provision making it mandatory to maintain lights in front of all elevator openings.

*Joseph Johnson:*

Where natural light is lacking it should be mandatory to maintain lights in front of all elevator openings.

*Dr. S. Adolphus Knopf:*

There should, by all means, be a provision making it mandatory that lights be maintained in front of all elevator openings. To prevent elevator accidents I would recommend proper safeguards and a regular official inspection at least once a month.

*Benjamin C. Marsh:*

There should be a provision making it mandatory to maintain lights in front of all elevator openings. What measures could be taken to prevent elevator accidents is a technical question. As many automatic safeguards should be provided as possible, and the owners of buildings used for manufacturing purposes should be obliged to instal reasonable safeguards.

*Jacob Panken:*

All machines in manufacturing establishments should have all safety appliances, and inspectors conversant with machinery should be employed by the Commission to inspect the machinery used in shops.

*Dr. Delancey Rochester:*

A provision should be made making it mandatory to maintain lights in front of all elevator openings.

*P. Tecumseh Sherman:*

As to whether a provision should be made making it mandatory to maintain lights in front of all elevator openings, and what measures would tend to prevent elevator accidents, should be left to the board of technical experts.

*F. S. Tomlin:*

In case the elevator is in a place where natural light is not sufficient there should be a light in the daytime, and in all cases a light should be kept burning at night in case of work being performed in the building.

*Charles Yates and Edward V. Wood:*

There should be a provision making it mandatory to maintain red lights in front of all elevator openings. We would recommend that to prevent elevator accidents, men and not boys should be employed to operate the cars, and automatic opening devices should be installed.

### OCCUPATIONAL DISEASES.

*Frederick L. Hoffman:*

I have frequently argued in favor of the compulsory physical examination of employees in unhealthy and dangerous industries. If it is the duty of the State to prevent the existence of unsuitable or unfavorable conditions in industry, it is equally the duty of the State to prevent the employment of persons at work unsuitable to their physique or condition of health. I am satisfied that such a medical examination would not be a serious matter, but, as has been the case in Massachusetts, prove most useful in eliminating from dangerous or unhealthy trades such persons as by their physique or condition of health are likely to be seriously injured in consequence of their calling. This applies particularly to the dusty trades and to occupations involving the risk of physical overstrain. The suggestion further applies chiefly to young persons and women, many of whom work under conditions or at tasks for which their physique or condition of health make them more or less disqualified, and the pursuit of which involves the risk of an early physical breakdown with consequent permanent impairment of industrial and physical efficiency.

American physicians have almost entirely neglected the field of occupation diseases, and most of our information concerning their nature, causes and distribution is derived from foreign sources. Our physicians can materially aid the cause of industrial disease prevention by bringing to public attention in the meetings of med-

ical societies the facts and circumstances of suggestive cases of illness, due more or less to the conditions under which the patient was employed.

*Mrs. Florence Kelley:*

Physical examination of employees should not be confined to dangerous industries. It should be a routine part of the work of the medical division of the Labor Department.

*Dr. S. Adolphus Knopf:*

The majority of patients who come under my observation in tuberculosis dispensary and hospital work in New York city are garment workers.

I would recommend better ventilation and sanitation of workshops, better hygiene of tenements and reasonably short hours.

I favor periodical physical examination of all employees in dangerous and non-dangerous industries.

Physicians can co-operate to bring about a more thorough knowledge of the prevalence and extent of occupational poisoning or diseases and the method of combating them by reporting and studying them.

If by industrial consumption — a term with which I am not familiar — is meant tuberculosis, phthisis pulmonalis, or pulmonary consumption, caused directly or indirectly by certain industrial occupations, I would wish to say that in my estimate nine tenths of all tuberculous cases are due to predisposition or infection contracted in the pursuit of some industrial occupation, if we include among these the clerks that work indoors, salesmen and saleswomen, bookkeepers, post-office clerks and other employees.

To check the disease, avoid bad housing, underfeeding, overwork, underpay; educate the masses in general hygiene, take care of the tuberculous at the right time and at the right place, and have state and municipal governments strengthened to enable them to inaugurate preventive measures to combat tuberculosis as a disease of the masses; and lastly, create a Federal Department of Health, the head of which should have a seat in the cabinet.

*Benjamin C. Marsh:*

Every possible safeguard for the workers in unsafe occupations should be provided, and the use of any material which is poisonous should be prohibited.

I favor compulsory physical examination of employees in dangerous industries. Physicians can co-operate to bring about a more thorough knowledge of the prevalence and extent of occupational poisoning or diseases and the method of combating them by discussion and publicity.

(2) Better lighting of rooms should be secured, too long hours of work should be prohibited, adequate wages should be paid. Industrial consumption, like tenement consumption is chiefly a disease of darkness, overwork and inanition and bad air and only secondarily a disease of the lungs.

*E. A. Quarles:*

These questions could all be worked out by a Division of Medical Inspection.

*Dr. Delancey Rochester:*

To check occupational poisonings and diseases I would recommend proper ventilation and the use of proper respirators, and when the poisoning is absorbed through the skin, the compulsory cleansing of the hands and covering them with proper gloves.

The careful examination by competent medical men of those employed in dangerous industries should be made compulsory, at least four times a year.

Physicians can co-operate to bring about a more thorough knowledge of the prevalence and extent of occupational poisoning and diseases and the method of combating them, by talks to employers and employees illustrated by lantern slides and other materials.

Of all those who die between the ages of 15 and 45, one-third die of pulmonary tuberculosis. Consumption is much more prevalent with those who work indoors than with those engaged in outdoor occupations; it is especially prevalent in dusty occupations.

*P. Tecumseh Sherman:*

I am not in favor of compulsory physical examination of employees in dangerous industries, but I do favor such examination in unsanitary industries.

Physicians can co-operate in bringing about a more thorough knowledge of the prevalence and extent of occupational poisoning or diseases and the method of combating them, by reporting cases that come under their observation.

To check industrial consumption, I would recommend that the same should be investigated and left to the Board of Medical Advisers

*Charles Yates and Edward V. Wood:*

Expert advice should be had as to the extent of occupational poisonings and diseases in the State of New York, and as to what measures should be recommended to check such poisonings and diseases.

I favor compulsory physical examination of employees in dangerous industries. Let the physicians say how they can co-operate to bring about a more thorough knowledge of the prevalence and extent of occupational poisoning or diseases and the method of combating them. Cases of industrial consumption are too many to enumerate.

## EMPLOYMENT OF WOMEN AND CHILDREN IN INDUSTRY.

*Dr. George W. Goler:*

The employment of girls under 16 years of age should be prohibited in all industries. The employment of women should be prohibited in these industries requiring speeding-up, heavy manual labor, and in such further industries as physical examination shall show to be undesirable for the employment of women.

The employment of males under 16 years of age should be prohibited. If the physical examination of all persons is undertaken at the outset of their employment, there will be no physically unfit children in employment.



Employment of any pregnant woman should be prohibited, and no woman with a child under a year old should be permitted to enter into factory employment. All women in pregnancy and with children under a year old should be pensioned during that period.

*Herman Grossman:*

Children under 16 years should not be permitted to work in any factory regardless of sex.

Children that are unfit should not be employed. I am opposed to compulsory physical examination. I don't think any child would accept a position unless he knew he could do the work.

*A. S. Haight:*

There should be as stringent a compulsory physical examination as possible of children periodically up to 18 years of age in all industries.

*Mrs. Florence Kelley:*

The employment of girls under the age of 16 years should be prohibited in all those occupations in which it is already forbidden and also in stores, offices, on the stage and in the manufacture of tobacco and all other substances known to be injurious to the immature physique.

By reason of the nervous strain which it entails, employment of girls under the age of 21 years should be prohibited in the telephone service and in all gainful occupations after 6 P. M.

The employment of women should be prohibited in and about mines, and in all gainful occupations after 6 P. M.

The employment of males under 16 years of age should be forbidden in all these occupations in which it is already prohibited, and in all other occupations now generally recognized as dangerous to health or morals. This enumeration should, however, be made specific and transferred from the Penal Code to the Labor Law, to be enforced by the State Department of Labor.

The employment of males under 21 years of age should be prohibited in all running of elevators, in the delivery of telegrams and messages in the service of telegraph and messenger companies, on the same grounds on which such employment is now prohibited between the hours of 10 P. M. and 5 A. M. Every argument for such prohibition for the shorter period applies for the whole 24 hours, with the single exception of the loss of sleep through work at night which is obviously already covered by the statute.

*Benjamin C. Marsh:*

The employment of girls, both under 16 years of age and 21 years, and of women, should be prohibited in all industries in which their employment means a reducing of wages below what would be paid to the men for the same grade and amount of work, and in all industries in which their physical strength is unduly taxed, especially in all cases where there is night work. The employment of males should be prohibited as messenger boys, pool room attendants, etc., also in industries where their strength would be unduly taxed.

The employment of physically unfit children should be prohibited by law and there should be compulsory examination of all children under 18 periodically in all industries.

Women should not be permitted to work in factories at least three weeks before and three weeks after childbirth.

*Mrs. Frederick Nathan:*

The employment of girls should be prohibited in stores and factories. The employment of women should be prohibited where the work is so severe that it is a strain on the constitution. Physically unfit children should not be permitted to work.

*E. A. Quarles:*

There should be compulsory physical examination of children periodically up to 18 years of age, in all industries.

*Dr. Delancey Rochester:*

It would be better that no one, male or female, should be employed in factories of any sort under the age of 18 years; that the employment of all under 16 years should be absolutely prohibited.

*P. Tecumseh Sherman:*

Questions as to what industries the employment of women and girls, and males, should be prohibited, should be left to the Board of Medical Advisers.

To prevent the employment of physically unfit children I would recommend that the Factory Inspectors be given power to require the discharge of minors from employment for which they are unfitted, subject to reversal by the Board of Health.

The employment of women immediately before and after childbirth should be prohibited by imposing a fine upon the employer, superintendent or foreman, who knowingly employs such women.

*Charles Yates and E. V. Wood:*

The employment of girls should be prohibited in all industries.

## HOURS OF LABOR.

*J. B. Callacy:*

One hour lunch period should be made mandatory.

*S. M. Dix:*

The one hour lunch period should not be made mandatory.

*Herman Grossman:*

Eight hours a day for women and children should be the standard. Seven days a week labor can be prevented in all industries by enforcing a law to that effect. It also depends on the labor organizations to prohibit the members working seven days. Female minors or male minors between the ages of 16 and 18 should absolutely not be permitted to work more than ten hours. They

should not be permitted to work more than eight hours. Male minors between 16 and 18 should not be permitted to work after 10 P. M. or before 6 A. M. It would be enough if they have to work till 8 o'clock, but they should not start before 8 A. M. A one-hour-lunch period should positively be made mandatory. This will give employees a chance to take a walk, because a half an hour passes before they have time to finish their lunch.

*Dr. George W. Goler:*

One hour lunch period should be made mandatory.

No woman or child should be permitted to work more than eight hours. Seven days' labor in the week can be prevented by stopping it. No minor of either sex should be permitted to work more than eight hours, nor should they be permitted to work after 5 P. M. or before 8 A. M.

*A. S. Haight:*

Female minors or male minors between the ages of 16 and 18 years should be permitted to work more than ten hours if well and strong, and they so desire. This also applies to male minors 16 and 18 working after 10 P. M. or before 6 A. M. A one-hour-lunch period should be made mandatory.

*H. E. Hessler:*

One hour lunch period should be made mandatory.

*Mrs. Florence Kelley:*

In the interests of uniformity among employees and employments, we recommend establishing the eight hour day for children in all occupations, with 8 A. M. as the opening and 5 P. M. as the closing hour.

We recommend abolishing the Christmas exemption for girls over 16 years of age in stores in December, by which they now work unlimited hours during eight days, and extending uniform provisions and uniform inspection throughout the first, second and third class cities. There is no more reason for variety in treatment of mercantile employees than of workers in manufacture. The great need is for simplicity and uniformity.

We recommend making the hours of labor uniform for women and minors.

We recommend establishing a uniform closing hour for the work of women and minors in manufacture, commerce, hotels, offices, telephone service, bakeries, restaurants and laundries.

The working-day for women and minors should not exceed ten hours in any case; the working week should be limited to 54 hours with the option of nine hours on six days or ten hours on five days and four hours on Saturdays. This, however, is merely an immediate step on the way towards a working week of 48 hours and a working-day of eight hours for women and minors.

The work of women and minors should be limited to six days in the week.

In the interest of uniformity, the enforcement of all provisions with regard to labor on Sunday should be lodged with the State Department of Labor not, as at present, with the local police.

The most easily enforced law on the statute books of New York State with regard to the hours of labor is that which prescribes that children under the age of 16 years shall not be employed in manufacture before 8 A. M. or after 5 P. M. Every person concerned knows when this law is violated, children, employers, parents, fellow-employees, passers-by in the streets. For this reason it is of the greatest possible value to the children, being almost self-enforcing.

Other laws governing working hours of women and minors and children are enforceable just in proportion as they approach this simplicity, uniformity and definiteness.

The present law governing the working hours of adult women is composed of the bad, left-over remnants of former times surviving in the English factory acts, from which it is copied. It omits the good points which are found in the English textile acts, i. e., the definite limit of the working week to six days and of the working-day to ten hours and the definite opening and closing hours; and the posting of the daily working periods.

The present New York law for women is non-enforceable and illusory, and therefore demoralizing to every one concerned.

Because it permits working-days of varying lengths nominally for the purpose of making a shorter working-day on one day of

the week, it would be necessary, in order to convict an employer of violating the law, to have an inspector present watching a particular worker throughout an entire week.

For facility of enforcement, the presence of women and minors in a workroom at times other than those posted as their working periods should be forbidden, and should be made *prima facie* evidence of illegal employment. This should apply to all workplaces, not merely to some of them as at present.

Since limitation of working hours of women and minors is established in the interest of the health of women and all minors, it should be maintained without seasonal interruptions. If the nature of the work calls for night work or irregular or overtime work, men should be employed.

Night work and overtime should be the monopoly of men who are better able to protect their interests in regard to it than either women or children, because men can both vote and expedite legislation for their protection, and also organize and thus enforce their demands. Women and minors can do neither and are, therefore, in need of clear, definite, rigid time limits with uniform opening and closing hours, Sunday rest, night rest, posting of hours, and acceptance of their presence on the premises at times not included in the posted hours as evidence of illegal employment.

The mercantile employees' law should be extended to apply to the telephone service in which a large proportion of employees are minors who, at present have no restrictions upon their work at night.

Seven days labor can be limited in all industries by prohibiting it and attaching heavy penalties for violation of the law. Continuing process need not mean continuing employment of any one person. Relay work can be arranged.

Females at any age should not be allowed to work more than ten hours in any one day.

Male minors, between 16 and 18 years of age should not be permitted to work more hours in one day than will permit their regular attendance at a continuation school.

The same opinion applies as in the case of minors between 16 and 18 years of age.

A one hour lunch period should be made mandatory in the interest of the health of the employee, and also in the interest of the enforcement of the limit upon the working hours. Variations in the length of the lunch hour are one of the most available means of violating the statute fixing the length of the working-day.

*Dr. S. Adolphus Knopf:*

One hour for lunch should be made mandatory. An opportunity should be given to indoor laborers to rest or enjoy themselves in the open air.

*Benjamin C. Marsh:*

I would recommend that the existing laws relating to the number of hours per day or week that women or children are permitted to work be changed by the enactment of the so-called 54-hour bill by the next session of the Legislature.

Seven days a week labor can be prevented by making it a felony.

Female minors or male minors between the ages of 16 and 18 years should not be permitted to work more than ten hours, and male minors between 16 and 18 should not be permitted to work after 10 P. M. or before 6 A. M. The number of hours of work per day or week should be limited in the case of male minors between the ages of 18 and 21 years. A one hour lunch period need not necessarily be made mandatory if the total number of hours of work is reduced to eight or nine.

*Mrs. Frederick Nathan:*

I would recommend at present 54 hours a week for women or children to work, looking toward an ultimate ideal of 44 hours a week. Seven days in the week industry can be prevented by having shifts when necessary. Male minors between 16 and 18 should not be permitted to work after 10 P. M. or before 6 A. M. The number of hours of work per day or week should be limited in the case of male minors between the ages of 18 and 21 years. A one hour lunch period should not be made mandatory.

*Jacob Panken:*

No minors between the ages of 16 and 18 should work more than eight hours a day, nor should they be permitted to work between 8 P. M. and 7 A. M. Minors between 18 and 21 should not be permitted to work more than ten hours a day, and not be permitted to work at all between 10 P. M. and 6 A. M.

A one hour lunch period should be made mandatory.

The law permitting children between 14 and 16 to work certain hours of the day should be repealed, and no minors under 16 should be permitted to work under any circumstances or at any time. The provision in the law suspending the law regarding female workers between December 15 and January 1st with regard to the employment of children of whatever age, should be repealed.

*E. A. Quarles:*

Female minors or male workers between the ages of 16 and 18 years should never under any circumstances be permitted to work more than ten hours, nor should male minors between 16 and 18 ever be permitted to work after 10 P. M. or before 6 A. M. The number of hours of work per day or week should be limited in the case of male minors between the ages of 18 and 21 years. A one hour lunch period should be mandatory.

*Dr. Delancey Rochester:*

Eight hours of actual labor is all that should be demanded of any male or female, and sufficient shift should be used as are necessary in those occupations in which work has to be maintained for a longer period.

A one hour lunch period should be made mandatory.

*P. Tecumseh Sherman:*

I would recommend that the law relating to the number of hours per day or week that women or children should be permitted to work be changed to be more elastic so that it will prohibit only what is in fact injurious to health.



Seven day labor cannot be prevented in all industries. As to allowing males between 16 and 18 years of age to work more than ten hours, I would say that males over 16 should be left alone. As to females, that should be left to the Board of Medical Advisors. Male minors between 16 and 18 should surely be permitted to work after 10 P. M. and before 6 A. M. under conditions not injurious to health. The number of hours of work per day or week in the case of male minors between the ages of 18 and 21 years should not be limited. Such laws are sentimental nullities.

*F. S. Tomlin:*

No man, woman or child should, under any circumstances, work more than 48 hours a week.

There is no occasion for any person to work seven days per week.

Male minors between 16 and 18 should not be permitted to work after 6 P. M. nor before 7 A. M.

If there is an eight-hour day, each occupation should arrange its own time for lunch.

*Charles Yates and Edward V. Wood:*

I would recommend that working hours should be eight hours for all. Seven days in a week labor can be prevented in all industries by making a law against it and then enforcing it, with absolute protection to the person refusing to work the seventh consecutive day. Female minors or male minors between the ages of 16 and 18 years should not under any circumstances be permitted to work more than 48 hours a week. Male minors between 16 and 18 should not be permitted to work after 10 P. M. or before 6 A. M., nor over eight hours between 6 A. M. and 10 P. M.

A one hour lunch period should be made mandatory.

## BAKERIES.

*J. B. Callacy:*

The use of cellars for bakeries should be prohibited because a cellar cannot get enough air and natural light. Destroy all exist-

ing cellar bakeries. In the future, bakeries are to be built on the main floor of the building.

It is not necessary that existing bakeries in which the distance between the floor and ceiling is less than nine feet be called unlawful. They can remain the way they are until the law is passed which will call for the destruction of all bakeries in cellars. There should be a compulsory physical examination made periodically of employees in bakeries.

*S. M. Dix:*

Establish standards and hold to compliance.

*Dr. George W. Goler:*

Cellar bakeries should be eliminated and employees required to furnish certificate of fitness from a certified medical examiner and not from just a doctor. Bakeries should be licensed.

*Herman Grossman:*

As to those cellars used for bakeries which are in existence already, we must see that all the requirements of the law are lived up to, but in the future, bakeries in cellars should not be permitted.

Existing bakeries in which the distance between the floor and ceiling is less than nine feet should positively be declared unlawful. Existing bakeries, the floors of which are of a depth greater than 4 ft. 6 in. below the street or sidewalk level adjacent to the building, should be prohibited. Employees in bakeries should be required to furnish a medical certificate of fitness.

Bakeries should be referred to the Health Department, and if they are good, clean and wholesome places, should be given a license. I am absolutely against allowing future bakeries to be opened in cellars. All bakeries should positively be licensed.

*A. S. Haight:*

The use of cellars for bakeries should be prohibited. Bakeries should be in clean, wholesome quarters always.

*H. E. Hessler:*

The use of cellars for bakeries should be prohibited. Existing bakeries in which the distance between the floor and ceiling is less than nine feet should be declared unlawful. Employees in bakeries should be required to furnish a medical certificate of fitness and there should be a compulsory physical examination made periodically of employees in bakeries.

*Joseph Johnson:*

In the case of bakeries already in existence, the use of cellars therefor need not necessarily be prohibited if clean, and as to future bakeries, the use of cellars need not be prohibited. The standard of ventilation in cellar or basement bakeries should be sufficient to be wholesome.

If the ceiling is fireproof, existing bakeries in which the distance between the floor and ceiling is less than nine feet need not be declared unlawful. Existing bakeries, the floors of which are of a depth greater than 4 ft. 6 in. below the street or sidewalk level adjacent to the building, should not necessarily be prohibited. Employees in bakeries should be required to furnish a medical certificate of fitness and there should be a compulsory physical examination made periodically of employees in bakeries.

*Mrs. Florence Kelley:*

The use of cellars for bakeries should be prohibited in the interest of (a) the employees, of (b) the consumers, of (c) the tenants for whom the additional heat in the tenements is an additional burden in the summer and of (d) the reduction of congestion of the population. It should be prohibited after a fixed, early, future date for bakeries already in existence, and immediately for all new bakeries.

Employees in bakeries should be required to furnish a medical certificate of fitness at frequent intervals in their own interest and that of the consumers.

*Benjamin C. Marsh:*

Within a year of the date of bill prohibiting such use, cellars for bakeries should be forbidden.

The standard of ventilation in existing cellar or basement bakeries should be the same as in factories. Existing bakeries in which the distance between the floor and ceiling is less than nine feet need not necessarily be declared unlawful, if within a year of the date of bill prohibiting their use, the law is complied with. Existing bakeries the floors of which are of a depth greater than 4 ft. 6 in. below the street or sidewalk level adjacent to the building, should be prohibited. A medical certificate of fitness should be required of all employees in bakeries, and there should be a compulsory physical examination periodically of employees in bakeries. All bakeries should be licensed.

*Mrs. Frederick Nathan:*

The use of cellars for bakeries should be prohibited both as to existing bakeries and future ones. Existing bakeries in which the distance between the floor and ceiling is less than nine feet should be declared unlawful. Existing bakeries the floors of which are of a depth greater than 4 ft. 6 in. below the street or sidewalk level adjacent to the building, should be prohibited.

Employees in bakeries should be required to furnish a medical certificate of fitness, and there should be a compulsory physical examination made periodically of employees in bakeries. All bakeries should be licensed.

*A. E. Quarles:*

The use of cellars for bakeries should be prohibited both as to existing bakeries and future ones. Existing bakeries in which the distance between the floor and ceiling is less than nine feet should be declared unlawful. Existing bakeries, the floors of which are of a depth greater than 4 ft. 6 in. below the street or sidewalk level adjacent to the building, should be prohibited. Employees in bakeries should be required to furnish a medical certificate of fitness, and there should be a compulsory physical examination made periodically of employees in bakeries. All bakeries should be licensed.

*Dr. Delancey Rochester:*

The use of cellars for bakeries should be prohibited as to existing bakeries and also as to future bakeries. Existing bakeries in which the distance between the floor and ceiling is less than nine feet should be declared unlawful. Existing bakeries the floors of which are of a depth greater than 4 ft. 6 in. below the street or sidewalk level adjacent to the building, should be prohibited. Employees in bakeries should be required to furnish a medical certificate of fitness, and there should be a compulsory physical examination made periodically of employees in bakeries. All bakeries should be licensed.

*P. Tecumseh Sherman:*

The use of cellars in existing bakeries should not be prohibited, but in future bakeries they should be, except where connected with shops, etc., which shops are above the basement. What standard of ventilation should be made mandatory in existing cellar or basement bakeries should be left to the Board of Medical Advisers with concurrent power in the Board of Health. With them should also be left the question as to whether existing bakeries in which the distance between the floor and ceiling is less than nine feet should be declared unlawful, whether existing bakeries, the floors of which are of a depth greater than 4 ft. 6 in. below the street or sidewalk level adjacent to the building, should be prohibited, whether employees in bakeries should be required to furnish a medical certificate of fitness, whether there should be a compulsory physical examination periodically of employees in bakeries, and what should be the minimum requirements of ventilation, light, height of ceiling, distance below street level in basement bakeries to be opened in the future. All bakeries should be licensed.

*F. S. Tomlin:*

The prohibition of existing or future cellar bakeries should be left to the discretion of the Commissioner of Labor, as also the standard of ventilation in such bakeries, the question whether

existing bakeries in which the distance between the floor and ceiling is less than nine feet should be declared unlawful, and whether existing bakeries, the floors of which are of a depth greater than 4 ft. 6 in. below the street or sidewalk level adjacent to the building should be prohibited, and whether bakery employees should be required to furnish a medical certificate of fitness, and there should be a compulsory physical examination made periodically of employees in bakeries. All bakeries should be licensed.

*Charles Yates and Edward V. Wood:*

The use of cellars for bakeries should be prohibited as to existing and future bakeries. Existing bakeries in which the distance between the floor and ceiling is less than nine feet should be declared unlawful, and bakeries the floors of which are of a depth greater than 4 ft. 6 in. below the street or sidewalk level adjacent to the building, should be prohibited. Employees in bakeries should be required to furnish a medical certificate of fitness, and there should be a compulsory physical examination made periodically of employees in bakeries. All bakeries should be licensed.

## FIRE PREVENTION, FIRE-ESCAPE FACILITIES AND BUILDING CONSTRUCTION.

*Edward F. Croker:*

It is absolutely necessary for the proper protection of employees to have mandatory legislation enacted for such fire drills as may be necessary, as the various employers will not go to the small expense and trouble for the purpose of protecting their employees unless compelled to do so.

It is almost impossible to lay down an absolute rule to govern all buildings, as they vary as to their exits and means of escape, etc., but there should be a competent person employed to be on duty continuously during working hours for the purpose of seeing that all fire appliances are in proper working order, stairs, hallways, etc., properly lighted, and that no rubbish or other materials likely to cause fire is allowed to accumulate, and that all

other matters such as unprotected lights, gas and heating irons, smoking, etc., are not allowed, and that an electric bell system is established throughout the building for the purpose of drilling one or more floors at the same time. The man above described should be in uniform and clothed to a certain extent with some authority. His duty should also be to drill the various employees from time to time and organize the male employees into various fire brigades and instruct them how to properly use the various fire appliances in case of fire.

*Gherardi Davis:*

Smoking in any part of a factory during working hours should hardly be made a crime. If you cannot stop it by discipline, you cannot stop it at all. The use of wooden or non-fireproof partitions in any part of a factory should not necessarily be prohibited. The spread of fire because of inflammable material used can be prevented by putting rubbish in metal cans. Automatic sprinklers should be installed. Exits to fire-escapes need not be painted red. It would be useless. The sashes need not be of metal. Change in the interior of manufacturing establishments, if not in violation of law, should be permitted without filing and approving of plans. Fire drills should be made mandatory once a week at first, following public school drills. I doubt whether it would be practicable to compel the installation of the so-called co-operative drill for the employees of different manufacturing establishments in the same building. The installation of automatic fire sprinklers should be made mandatory in all manufacturing establishments where inflammable materials are used. The mandatory requirement of automatic sprinklers should depend upon the character of the industry but not upon the number of persons employed or the distance of the establishment above the street level, or upon the height of the building in which the establishment is located. An auxiliary fire-alarm system should be mandatory in all factories and manufacturing establishments. It should be installed in each loft independently. Such system communicating direct with fire headquarters would probably not be practical and would tend to confuse the Department. Manufacturing above a certain number of stories should be prohibited. I consider this the most important of all your questions. My own idea is that

1. The number of people employed on a floor in manufacturing establishments should be reduced as you go up.

2. There should not be allowed any manufacturing of inflammable materials to be carried on above 100 feet and if inflammable materials are used in the lower stories, then the number of people employed above them should be very small.

3. I do not believe you can empty ten stories of a twenty-story building with a hot, smoky fire on the ninth floor, no matter how many means of exit you have in the building. The capacity of a staircase is small. The more turns it has, the smaller its capacity, because the movement is slow. I do not believe you can keep smoke out of the stairways, and a very little smoke makes a panic.

For these reasons it is my opinion that the employment of people in manufacturing establishments where inflammable material is used should not be allowed above the eighth or ninth story, and in any event, the number of people should be greatly reduced as you go up in the stories, and that no manufacturing of any kind should be allowed in a building above eight or nine stories in height if any inflammable materials are used in the building.

The locking of doors, if wilful, should be made a felony. The law should absolutely prohibit the use of doors or shutters opening inwardly that lead to exits or fire-escapes. It is hardly necessary that outside fire-escapes be constructed at or about the floor level. I do not see how it is possible to have a standard of construction for outside fire-escapes. It is a very difficult question to say what kind of ladders should extend from the lowest balcony to the ground, as it depends in part on the character of the building and the use of the store floor. The number of people permitted to work in a factory should depend upon the number and kind of exits provided. I should think it would be useless to have every manufacturing establishment post a card showing the maximum number of people permitted to work in it.

I am opposed to the bureaucracy involved in licensing factories and loft buildings. You will break down all supervision if you try too much. Let such things be regulated by the general building law. If the use is changed, the building must be changed.



Existing stairways and elevator shafts need not always be enclosed in fireproof walls. In existing buildings 50 x 80 feet, fire walls should be ordered installed. They are absolutely necessary. There should be no 50 ft. open lofts. Fire towers should be ordered in all existing buildings wider than 25 ft. and over 100 ft. high, but I doubt their efficacy in tall buildings. To secure adequate fire-escape exits, I should first limit the height of buildings.

*Robert W. DeForest:*

Some prohibition should be placed on the height above the ground at which a large number of employees might be congregated and where inflammable material might exist in any such amounts as to cause a repetition of the Triangle fire. I doubt if any form of fire-escape can be an adequate exit for, say, a hundred employees of average intelligence from the eighth, ninth, or tenth story of a building in case of an alarm of fire. In any case all such factories should have outside fire-escapes or other equivalent in the way of outside stairways with a standard of construction not less than that required by the Tenement law.

Such structural changes in existing buildings, however desirable, could not practically be obtained and the loss might be out of all proportion to the gain. When I say loss I do not merely refer to the cost of construction. Such drastic requirements might easily close many factories, throw people out of employment and prove a great hardship to the workers.

*S. M. Dix:*

Smoking during working hours should be made a crime in any part of a factory in cities of the first and second class. Wooden or non-fireproof partitions should be prohibited. The installation of automatic sprinklers should not be made mandatory in all factories. The prohibition of manufacturing above a certain number of stories depends upon the construction of the building and character of the business. Doors or shutters opening inwardly that lead to exits or fire-escapes should be absolutely prohibited. Outside fire-escapes should be constructed at or about the floor level

of the factory. There should be a standard of construction of outside fire-escapes. The number of people permitted to work in a factory should be dependent upon the number and the kind of exits provided. Such a provision should be made specific, based on the time required to get the employees out of the building. Every manufacturing establishment should have a card posted showing the maximum number of people permitted to work there. It seems reasonable that factories and loft buildings should be licensed for certain designated occupations, and that any change should be prohibited unless expressly authorized. Stairways winding around elevator shafts need not be removed if of fire-proof construction. The enclosing of elevator shafts and stairways in fireproof walls and the compulsory installation of fire walls, seem less fair than to restrict the use of inadequately protected property.

*J. W. Ferguson:*

It should be compulsory for every manufacturing concern having over 25 employees above the third floor in a building to have a fire drill under the supervision of proper monitors at least once a month.

The utility and safety of the present fire-escapes could be increased by substituting metal or metal covered sash glazed with wire glass for the ordinary wooden sash glazed with plain glass. The upper section of the sash should be securely fastened which would prevent the smoke or flames reaching the fire-escape in case the window was opened at the top. The lower section of the sash could be hung with weights if necessary, but preferably they should be closed.

Metal sash and wire glass should be placed in all windows opening onto the fire-escape or within 6 ft. of the same.

It is hardly necessary in existing buildings to change the wooden frame in which the sash is placed as they could not be destroyed in the five or ten minutes which would be necessary for the people to get out of the building.

New buildings should have metal frames as well as metal sash where they are adjacent to or open onto the fire-escapes.

The stairways in new buildings of more than four stories should have the stairs in a fireproof enclosure, independent of and in no way connected with the elevator. The only opening to the stairs should be from the main hallway or the loft, as noted on the enclosed sketch.

The door to the stairway shaft, as well as that to the elevator shaft, should have metal-covered frames and the doors should be metal-covered with wire glass if any light is required.

Where the building is large enough, the fire-escape should be enclosed in a fireproof shaft inside of the building, access to which should be by means of a balcony with a doorway, the doors opening out onto the balcony and doors from the balcony to the fire-escape opening in.

There should be no other communication to the shaft enclosing the fire-escapes.

A good protection for existing buildings would be to utilize the present stand pipe as a supply to sprinklers placed on all floors, each sprinkler head not to cover over 100 sq. ft. of area. This stand pipe should have a Siamese connection at the sidewalk, to which connection could be made from the fire engine. With this arrangement it would be possible for water pumped by the fire engine to be confined directly to the point where the fire existed without jeopardizing the life of the fireman who would otherwise have to fight his way through the smoke to reach the fire with the ordinary hose.

*J. R. Freeman:*

Automatic sprinkler protection should be made mandatory in substantially all manufacturing establishments where stock of a combustible nature is worked or where the apparatus or furnishing of supplies present any large amount of combustible material, such, for example, as clothing factories, woodworking factories, paper box and other paperworking factories, electrical apparatus factories, food product factories, etc., for all rooms exceeding, say, 2,000 sq. ft. in area (and in many cases irrespective of the area), and including factories constructed of incombustible materials as well as those of slow-burning construction and those of quick-burning construction.

The other great preventative of loss of life and property by fire is an improved degree of order and neatness, enforced by frequent rigid inspections, under which all waste material and rubbish is removed before night to a safe locality outside the manufacturing rooms.

*J. P. Gray:*

Smoking should be absolutely forbidden in any part of a factory or manufacturing establishment during working hours, and a severe penalty should be made to apply where such practice prevails.

I do not believe that any absolute rule in regard to the use of wooden or non-fireproof partitions in factories can be devised which will be feasible. I am of the opinion that this should be left to the discretion of the Inspection Department.

The only way that the spread of fire where inflammable materials are used can be prevented, is by the operatives being properly drilled as to how to care for such fires when they occur. Fire extinguishers are used, but the fire pail is of the greatest benefit because of the fact that every man, woman and child knows what it is there for and how to use it. All exits should have some distinguishing mark and this should be sufficiently plain to catch the eye of all persons in the room. I think it is immaterial whether the windows leading to the fire-escapes are glazed with wired glass or with plain glass. In any case, these windows should be so weighted that they can be easily raised, and inspection should be made often enough so as to know that they are in proper operating condition.

In the average manufacturing establishment I do not believe it would be feasible to require all changes in the interior to be submitted to the Department for approval before being carried out. Such regulation would greatly interfere with manufacturing operations. It should be a subject of inspection.

Fire drills of a varying degree should be required in all manufacturing establishments, depending upon the class of manufacturing and upon the number of operatives employed.

I believe it to be practicable to compel the installation of a so-called cooperative drill, where there are several manufacturing establishments in the same building. The owner of the building should be compelled to insist upon these drills and be held responsible for his tenants. Separate and independent fire drills for each tenant would be valuable when such drills are confined to handling of the apparatus for the prevention of spreading of fires. For quick and efficient departure from a building, combined drills are necessary.

For many years I have been firmly convinced that automatic sprinkler protection is an absolute necessity in all manufacturing establishments if loss of life by fire is to be prevented. The requirement for automatic sprinklers should not depend wholly upon the character of the industry nor upon the number of persons employed. It should be made mandatory in all manufacturing establishments where inflammable materials are used, or where operatives congregate in any number. Neither should it depend upon the height of the building, although possibly a one-story building might be omitted, but such buildings do not occur in our large cities.

The question of an automatic fire alarm in manufacturing establishments is one open to debate. Such systems easily get out of order, and unless a very complete system of supervision is devised they would be ineffective; further, unless the operatives were thoroughly drilled, they might tend to create panics.

Manufacturing should be prohibited above the tenth, story, preferably above the eighth, principally because of difficulty of providing a sufficient number of exits for operatives.

Locked doors in manufacturing establishments should be absolutely forbidden and a severe penalty applied to same. It is a dangerous practice.

The regulation of spacing of machinery is a most difficult problem and should be left, in my opinion, to the judgment of the management of the Inspection Department.

All doors and shutters on openings that lead to exits or fire-escapes should either open outwardly or be of the automatic sliding type. On openings into exit towers, a swinging fire door of any type is objectionable, in that, if opening outwardly into the

tower, it may swing into the faces of those coming down from above. The sliding door can be so protected at the sides by grill work that it can easily be slid back without any pressure from the operatives interfering with same.

While outside fire-escapes would be most effective if constructed at about the floor level of the factory, in many cases this would hardly be feasible; hence would have to depend upon individual cases and be a subject of discretion upon the part of the management of the department.

The number of people employed in a factory building should be dependent upon the number of fire exits provided. This should be left to the discretion of the responsible authority in each case.

Licensing certain buildings for certain designated occupations would not be feasible.

Stairways should not be permitted where they wind around elevators.

All elevator shafts should be enclosed in fireproof walls. I do not think that it would be quite feasible to enclose all existing stairways in fireproof walls. They should be enclosed, as far as feasible, by partitions constructed of expanded metal, or wired glass and cement, with doorway at the bottom of the stairways.

With automatic sprinkler protection, fire walls would be wholly unnecessary in buildings of the sizes mentioned in the question.

The need of fire towers in existing buildings depends largely upon circumstances and must be left to the judgment of the responsible authority in each case.

In all new buildings, at least two efficient methods of fire exit should be provided. The only efficient method of fire exit is through fireproof towers built specially for the purpose, and these towers should have no direct communication with the rooms. They could be constructed after the type of what is called the "Philadelphia stair tower." This tower is entered from each story by passing through a doorway outside the building and to an open platform and from thence into the tower.

*Herman Grossman:*

Smoking during working hours in any part of the factory should be made a crime. The use of wooden or non-fireproof

partitions in any factory should be positively prohibited. In order to prevent the spread of fire because of inflammable material used in manufacture, a hose should be at hand which should reach any part of the place. Doors and sashes of windows leading to exits should be painted red and should be of metal, if possible. Windows leading to fire escapes should be of wired glass. Changes in the interior of manufacturing establishments should be permitted only after the plans have been filed and approved. Fire drills should be made mandatory in all factories at least once a month. Of course, it would be better to compel the installation of a so-called co-operative drill for the employees of the different establishments in the same building. I would simply give an order that every manufacturer, when a certain signal sounds, send all the people out so that they may be drilled in this manner, and every manufacturer should be made familiar with what the signal would be, and in all the factories in the same building there should be an alarm bell. If they are properly trained, this will avoid panics and confusion in case of fire. They can begin to train them every two weeks separately, and once a month every shop in the building should have a general fire drill. It will be of great value to have this enforced.

The installation of automatic sprinklers should be made positively mandatory, especially where they manufacture clothing, furs, hair goods, shirt waists and underwear. Some connection should be made with the alarm bells of the different shops. For instance, if a fire begins on the third floor, the floors above should be notified, and they should also know by the number of bells what floor the fire is on. In all buildings where there are more than two manufacturing establishments, an automatic fire alarm should be put in without fail.

It is hard to settle whether manufacturing can be prohibited above a certain number of stories. It would be a very good thing if certain manufacturing were not allowed above the fifth floor, such as clothing, furs, hair goods, etc.

There should be a very heavy punishment for locked doors,—imprisonment, but no money fines.

The clear passageway between machines should be at least three feet. The law should absolutely prohibit the use of any doors

or shutters opening inwardly that lead to exits or fire escapes. The obstruction of the exit to fire-escapes by window sills should be prohibited. Fire-escapes should be constructed at or about the floor level of the factory. The standard of construction of outside fire-escapes should be left to architects. There should be a flight of steps with banisters to hold on to from the lowest balcony to the ground. The number of people permitted to work in a factory should depend on the number and kind of exits provided, because the manufacturer tries to have fewer exits on account of burglars, as they don't all go to the expense of hiring a watchman. If, however, you leave this provision to their discretion you will never have it. If you can enforce it, every manufacturing establishments should post the maximum number of people permitted to work there.

Factories and loft buildings should be licensed for certain designated occupations. There is no question about it. It would be a good thing if you were able to order the removal of stairways that wind around elevators in existing buildings. Elevator shafts and stairways should be enclosed in fireproof walls if possible in every building. I think it would be unnecessary to order fire towers in existing buildings, but we can have the regular alarm system; also on every floor have a large water hose. This will be much better than the tower. To secure adequate fire escape exits in future buildings, there should be a requirement that they be very wide, with steps and handle bars.

#### *A. S. Haight:*

Smoking should be prohibited in any part of the factory during working hours. Whether or not the use of wooden or non-fireproof partitions should be prohibited depends on general surroundings, escapes, protection, etc. It is a question which needs judgment and experience. In regard to changes in the interior of manufacturing establishments, I think we should make laws with as little detail as possible, and enforce them.

Separate and independent fire drills for different manufacturing establishments in one building would have no value whatever. The installation of automatic sprinklers should by all means be



made mandatory in factories. It depends upon the character of the building whether or not manufacturing should be prohibited above a certain number of stories.

The penalty for locking doors in factories while the employees are on the premises should be death by hanging. The law should absolutely prohibit the use of doors or shutters opening inwardly that lead to fire-escapes or exits, and also the obstruction of the exit to fire-escapes by window sills. There should be a standard of construction of outside fire-escapes. Safety and strength are essential. The number of people permitted to work in a factory should certainly be dependent on the number and kind of exits. Such a provision should be made discretionary, with appeal to higher authority. Existing elevator shafts and stairways should always be ordered enclosed in fire-proof walls.

*H. E. Hessler:*

Smoking in any part of the factory during working hours should be made a crime. The law should absolutely prohibit the use of doors or shutters opening inwardly that lead to exits or fire-escapes. Outside fire-escapes should be constructed at or about the floor level in manufacturing establishments.

*Joseph Johnson:*

Smoking in any part of a manufacturing establishment during working hours should be made a crime. Where the danger of fire is considerable, the use of wooden or non-fireproof partitions in any part of the factory should be prohibited. To prevent the spread of fire because of inflammable material used, sprinklers should be installed, and no large unbroken floor areas should be permitted. Doors and sashes of windows leading to exits need not necessarily be painted red. The sashes should be of metal if in fireproof walls or partitions. Windows leading to fire-escapes should be made of wired glass.

Changes in the interior of manufacturing establishments should be permitted only after plans have been filed and approved. Fire drills in factories should be made mandatory once a month. It is entirely practicable to compel the installation of co-operative

drill for the employees of different manufacturing establishments in the same building. The plan adopted would have to depend on the building and its occupancy. Fire drills for separate establishments would not have so much value as the co-operative drills. The installation of automatic sprinklers should depend on the height and occupancy of buildings. It should be partly regulated by the character of the industry, the number of persons employed, the distance of the establishment above the street level, and the height of the building in which the establishment is located. The mandatory installation of auxiliary fire-alarm systems should depend on the nature of the building and its occupancy. The operation of such a system is a matter of drill and detail.

Locking doors when employees are on the premises should be made a felony, as it is a restraint on a person's liberty. Measures for providing for proper spacing of machinery depend on the nature of the business. The law should generally prohibit the use of any doors or shutters opening inwardly that lead to exits or fire-escapes. The law should prohibit the obstruction of the exit to fire-escapes by window sills, and the fire-escapes should be built at or about the floor level. Generally there should be a standard of construction of outside fire-escapes, but it should be subject to special modifications. From the lowest balcony to the ground there should be a stairway balanced by a counterweight. The number of people permitted to work in a factory should generally depend on the number and kind of exits, but it should depend somewhat on construction of the building and the auxiliary fire appliances. Such a provision would have to be largely discretionary. Every manufacturing establishment should have a card posted showing the maximum number of people permitted to work there. Factories and loft buildings should generally be licensed for certain designated occupations.

Stairways winding around elevator shafts need not be ordered removed from existing buildings. The enclosing of existing elevator shafts and stairways in fireproof walls, and the installation of fire walls, depend on the construction of the building and its occupancy. Fire towers should be ordered in buildings where dangerous conditions exist. To secure adequate fire-escapes in buildings to

be constructed in future, the Fire Department should pass on plans of exit. I have no criticism to make of the recent Sullivan-Hoey law, nor any changes to recommend.

*Charles H. Keyes:*

Smoking in any part of a factory or manufacturing establishment during working hours should be made a punishable offense. Wooden and non-fireproof partitions in any part of a large factory or manufacturing establishment above the fourth floor should be prohibited.

(a) Sprinkler systems, fire walls, fire extinguishers, scrupulous cleanliness and constant oversight by somebody charged with such work can all be used to prevent the spread of fire.

(b) Some standard means of indicating the doors and windows leading to fire-escapes should be agreed upon, and probably the red danger signal should show in the door frames and window sashes as well as in the enclosures of the lights which mark them at night.

(c) Metal sash is an essential part of a fire-proof trim.

(d) Windows leading to fire-escapes should not be made of wired glass. Changes in the interior of manufacturing establishments which in any way enhance the character of the hazard should be permitted only after the filing of plans which have been approved by the proper authority.

It would be sufficient if fire drills would be enforced in manufacturing establishments employing many people and especially where business is carried on in tall buildings. Much facility could be secured and time saved if practice in the going out by fire drill routes could be given through dismissing the employees over these routes on certain evenings, the fire alarm signal being given at the close of the day.

With many different manufacturing establishments in the same building it is probable that the drill would have to be in charge of a representative of the Fire Prevention Department, to insure its success.

Separate and independent fire drills for different manufacturing establishments in one building would be valueless unless each particular establishment had its own exits and in no way would interfere with those coming or going to or from other factories.

The installation of automatic sprinklers should be made mandatory in all factories dealing with inflammable material and especially where such manufacturing is carried on above the fourth floor.

The mandatory requirement of automatic sprinklers would depend upon the degree of risk involved in any industry, upon the number of persons exposed to the hazard, the distance of the work above the street level, the height and character of the building in which the establishment is located.

As buildings have been constructed in the past, probably very much more good than harm could be done by prohibiting manufacturing above the sixth floor. With fire-proof buildings, containing adequate exits each including generous stairways, self-contained elevators and Philadelphia fire towers, together with proper fire walls dividing the floor space into several areas, it is possible to carry on manufacturing with safety at double that height.

The maintaining of locked doors of manufacturing establishments while there are employees on the premises needs to be punished by both fine and imprisonment.

Machinery should be so placed as to leave clear passageways to all exits and fire-escapes.

There is no possible excuse for permitting doors or shutters leading to exits or fire-escapes to open inwardly.

The law should also prohibit the obstruction of the exit to fire escapes by window sills.

There should be a prescription that the openings should be brought down to about the level of the floor at fire-escapes.

In all cases of outside fire-escapes added safety would be provided if their construction could be standardized.

The number of people permitted to work in any factory should certainly be limited upon the number and character of the exits provided.

The minimum standard of safety which it is desirable to tolerate should be prescribed in the law, but some responsible authority should be given power for making this requirement more stringent in the case of particularly hazardous establishments.

It would certainly contribute to the ready enforcement of the law if every manufacturing establishment were required to keep a large card posted on each floor showing maximum number of people permitted to work on that floor.

New license should be required whenever a change of use occurs. Registration or license should be renewed when either change of location or change of the character of the business takes place.

Stairways that wind around elevators should not be permitted to count as exits in addition to the elevators.

Whenever possible the stairways should be enclosed in the fire-proof walls.

No new buildings should be erected which do not break into comparatively small fire units all the floor space. It might be highly desirable to divide a 25 x 80 floor into two units, a 50 x 80 into four, and a 75 x 80 into six; but it is a question whether in many instances such division would be entirely feasible.

Very tall buildings involving specially hazardous lines of manufacturing should afford every possible means for the safety of inmates in case of fire or panic. If in any particular instance this cannot be accomplished without the fire tower, such installation should certainly be ordered.

The conference committee of architects, engineers and builders which were in session with the city officials and committees representing the city government, reached a practical agreement on every item of the Building Code with the exception of eight. All eight of these items bore upon the seemingly irreconcilable conflict between hollow tile and concrete interests.

The law has been in operation altogether too brief a period to warrant adverse criticism. It is manifest that this law furnishes large opportunity for desired fire protection.

*Eugene L. Lezinsky:*

We are in favor of a law making smoking in factories during working hours a crime, but we have great doubts as to its possible enforcement.

We favor fireproof sliding doors which we could consider better than either doors opening in or out.

*Benjamin C. Marsh:*

A law making smoking in factories during working hours a crime could not be enforced. The use of wooden or non-fireproof partitions in any part of a manufacturing establishment should be prohibited.

Fire drills should be made mandatory in manufacturing establishments as often as necessary to give operatives the training required, and the installation of automatic sprinklers should be made mandatory in factories and manufacturing establishments. A fire-alarm system should be installed in every manufacturing establishment. Manufacturing should be prohibited at least above the tenth floor.

Locked doors should be made a misdemeanor with a maximum penalty. The clear passageway between machines should be at least three feet. The law should absolutely prohibit the use of any doors or shutters opening inwardly that lead to exits or fire-escapes. Obstruction of the exit to fire-escapes by window sills should be prohibited, and fire-escapes should be constructed at or about the floor level of the factory. There should be a standard of construction for outside fire-escapes. From the lowest balcony to the ground I would recommend the kind of stairway which drops automatically as the person steps on it.

The number of people permitted to work in a factory should depend upon the number and kind of exits. This provision should be made specific. Every manufacturing establishment and every room in that manufacturing establishment should have a card posted showing the maximum number of people permitted to work there.

Factories and loft buildings should be licensed for certain occupations, and changes in the nature of occupancy should not be prohibited unless authorized.

Existing stairways winding around elevators should be ordered removed, and existing stairways and elevator shafts should be ordered enclosed in fireproof walls. Fire towers should be ordered installed in existing buildings in which horizontal exits are not possible.

To secure adequate fire-escapes in future buildings, each building will have to be taken up individually and a ratio established between the number of occupants and the fire exits.

*Mrs. Frederick Nathan:*

The use of wooden or non-fireproof partitions in factories should be forbidden where there is inflammable material. The fire walls can be installed to prevent the spread of fire because of inflammable material.

Doors and window sashes leading to exits should be painted red, and such sashes should be made of metal.

Changes in the interior of a manufacturing establishment, when there is a change of occupancy, should be permitted only after plans are filed and approved. Fire drills should be made mandatory once a month. It is practicable to compel the installation of the co-operative fire drill. The mandatory requirement of automatic sprinklers should depend upon the character of the industry, the number of persons employed in the establishment, the distance of the establishment above the street level, and upon the height of the building in which the establishment is located, irrespective of the number of employees in the particular establishment.

Locked doors in a factory should be made a felony. Laws should prohibit absolutely the use of doors or shutters opening inwardly leading to fire-escapes or exits, and the obstruction of the exit to fire-escapes by window sills. Outside fire-escapes should be constructed at or about the floor level of the factory.

The number of people permitted to work in a factory should depend upon the number and kind of exits provided. Every manufacturing establishment should post a card showing the maximum number of people permitted to work there. Factories and loft buildings should be licensed for certain designated occupations, and changes should be made only when expressly authorized.

Stairways that wind around elevators should be ordered removed in existing buildings, unless the elevators be made fireproof. To secure adequate fire-escape exits in future buildings, fire towers, fire walls and enclosed stairways should be provided.

*E. A. Quarles:*

Smoking in any part of the factory during working hours should be made a crime. The use of wooden or non-fireproof partitions in any part of a factory should be prohibited.

To prevent the spread of fire because of inflammable material used in manufacture, there should be stringent rules against the accumulation of litter on floors or work tables, and within convenient reach, boxes of sand should be kept on hand. Doors and sashes of windows leading to exits should be painted red, such sashes should be of metal, and windows leading to fire-escapes should be of wired glass.

Changes in interior of manufacturing establishments should be permitted only after the filing and approval of plans. The installation of automatic sprinklers should undoubtedly be made mandatory.

The penalty for locked doors in a factory while employees are on the premises should be imprisonment in the penitentiary for five or ten years. The law should absolutely prohibit the use of doors or shutters opening inwardly. The law should prohibit the obstruction of the exit to fire-escapes by window sills, and outside fire-escapes should be constructed at or about the floor level of the factory. The number of people permitted to work in a factory should undoubtedly depend upon the number and kind of exits provided. I am in favor of making this a specific provision.

I am heartily in favor of licensing factories and loft buildings for certain designated occupations and forbidding any change unless expressly authorized.

Existing elevator shafts and stairways should be ordered enclosed in fireproof walls. Fire walls should be installed in all existing buildings.



*J. P. Quigley:*

Smoking in factories during working hours should be prohibited by law. The use of wooden or non-fireproof partitions should depend upon the location of the factory and its inflammable nature. In order to prevent the spread of fire because of inflammable material, there should be smaller areas with openings guarded by fire doors. It would, perhaps, be a good idea to paint the doors and sashes of windows leading to fire-escapes red. Sashes should be metal. Unless the entire building were trimmed with wired glass, I think it would be unnecessary to use it in windows leading to fire-escapes. All factories above three stories in height should have a fire-alarm system. They could be worked out satisfactorily in loft buildings. All factories that have a fire-alarm system should be connected with Fire Headquarters. In well-regulated factory buildings, with ample exits and stairways, I think the height might be left to the discretion of the manufacturer. Nothing short of a severe penalty will prevent the locking of doors in factories, and it might be well to have a large percentage of that penalty paid to the one who reports the violation.

The law should prohibit the use of any door or shutter opening inwardly, but I am not so sure as to a fire-escape. Fire-escapes should be no higher than the floor level. Windows leading to fire-escapes should be made into doors. Outside fire escapes are at best nothing more than a last resort, but they should in any event be on an incline with easy risers and wide treads guarded with hand rails on each side, and on each floor there should be a large balcony. The lower balcony should be at least twice the capacity of those above it, with a stairway hinged and hanging on a counterweight which will easily drop when a person steps upon the tread. The number and kind of exits should depend on the number of people working in a factory above the ground floor. This provision should be left to the discretion of a responsible authority.

Every industry should be reported to some certain authority. Whether a license should be demanded is perhaps another matter.

If there is but one stairway leading to the upper floors of a building it should not wind around elevator shafts. Existing

stairways should be ordered enclosed in fireproof walls, and fire walls should be ordered installed in existing buildings. This can well be ordered under a comprehensive building code.

In future buildings adequate fire-escape exits can be secured by ordering wide and ample stairways enclosed in brick towers.

*J. F. Reagan:*

Smoking in factories during working hours should be made a crime. The use of wooden or non-fireproof partitions in any part of the factory should be prohibited. The installation of automatic sprinklers should be made mandatory in all factories. The law should absolutely prohibit the use of doors or shutters opening inwardly which lead to fire-escapes or exits. Outside fire-escapes should be constructed at or about the floor level of a factory. Factories and loft buildings should be licensed for certain designated occupations, and any change should be prohibited unless authorized.

Ladders or stairways from the lowest balcony to the ground should be the balanced stairway type with two hand rails. Many of the existing elevator shafts and stairways should be enclosed in fireproof walls, if not all of them. Fire walls should be ordered in buildings of 50 by 80 feet or larger.

To secure adequate fire-escape exits in future buildings, stairs with fireproof walls should be required.

*Dr. Delancey Rochester:*

Smoking should be prohibited in factories during working hours. Changes in the interior of manufacturing establishments should be permitted only after plans have been filed and approved. Fire drills should be mandatory once a month. The law should absolutely prohibit the use of any door or shutters opening inwardly that lead to fire-escapes or exits, and the obstruction of the exit to fire-escapes by window sills. Outside fire-escapes should be constructed at or about the floor level of the factory, and there should be a standard of construction for all outside fire-escapes. Every manufacturing establishment should have a card posted showing the maximum number of people permitted to work in it.

*W. G. Sewall:*

The Standard Automatic Sprinkler Equipment solves the problem of safeguarding life and property in our factories. It is expensive, but it is worth while. It will pay for itself ordinarily in from three to five years in the savings of fire insurance premiums.

*P. Tecumseh Sherman:*

In certain kinds of factories smoking should be made a crime and the use of wooden or non-fireproof partitions should be prohibited; in others, decidedly not. To prevent the spread of fire because of inflammable material, the use of fireproof receptacles should be required. It is not always advisable that the doors and sashes of windows leading to exits should be painted red, that such sashes should be of metal, or that windows leading to fire-escapes be made of wired glass.

It is not necessary that a change in the interior of manufacturing establishments be permitted only after plans have been approved. The Fire Department should be given power to conduct fire drills. It is entirely practicable to compel the installation of co-operative fire drill, if conducted by government officials with power. In buildings with several or more establishments, separate and independent fire drills would have very little value. The installation of automatic sprinklers should not be made mandatory in all factories. It should depend upon less arbitrary and more elastic conditions, to be laid down by the Fire Department or by a board of technical experts. This also applies to the requirement of an auxiliary fire-alarm system connected with Fire Headquarters in factories and manufacturing establishments. Manufacturing above a certain number of stories should not be prohibited. The penalty for locked doors while employees are on the premises should depend upon what doors are locked, and who locks them.

The proper spacing of machinery, the prohibition of doors or shutters opening inwardly, and the obstruction of exits to fire-escapes by window sills, should be left to a board of technical experts. It is not necessary that fire-escapes be constructed at or

about floor level of the factory, except where large numbers are employed. No common standard of outside fire-escapes will fit all conditions. The kind of ladders or stairs from the lowest balcony to the ground should be left to a board of technical experts. The number of people permitted to work in a factory should depend upon the number and kind of exits provided. This provision should be left to a board of technical experts.

Every establishment of a tenant factory should have a card posted showing the maximum number of people permitted to work there. It seems to me sufficient to license the establishment and forbid any change in such establishment without a license. Stairways that wind around elevator shafts in existing buildings should not be ordered removed, unless they are the sole stairways in the building. Existing elevator shafts should not be ordered enclosed in fireproof walls. The installation of fire walls in existing building should be left to the board of technical experts or the Fire Department,—as also should the requirement of the fire towers, and provisions to secure adequate fire-escape exits in buildings to be constructed in the future. The present building code should be entirely re-framed.

*J. Waldo Smith:*

The use of automatic sprinklers should be required in practically every manufacturing establishment where materials of a combustible nature are either stored or worked, as well as in all manufacturing establishments which are not absolutely fireproof in their construction.

*D. J. Sullivan:*

Smoking in any part of a factory during working hours should be made a crime and the use of wooden or non-fireproof partitions should be prohibited. In order to prevent the spread of fire because of inflammable material used, the sprinkler system should be installed. Doors and sashes of windows leading to exits should be painted red, such sashes should be made of metal, and windows leading to fire-escapes should be made of wired glass. No change in the interior of a manufacturing establishment should be per-

mitted until the plans have been filed and approved. Fire drills should be mandatory at least once in every two weeks. Separate and independent fire drills for different manufacturing establishments in one building would have no value.

The installation of automatic sprinklers and auxiliary fire-alarm systems connected with Fire Headquarters should be made mandatory in all manufacturing establishments.

The penalty for locked doors in a factory while employees are on the premises should be imprisonment.

The law should absolutely prohibit the use of any doors or shutters opening inwardly which lead to fire-escapes or exits. The law should prohibit the obstruction of the exit to fire-escapes by window sills. Fire-escapes should be constructed at or about the floor level of the factory, and there should be a standard of construction of outside fire-escapes. From the lowest balcony to the ground there should be a cantilever stairway. The number of people permitted to work in a factory should depend upon the number and kind of exits provided. Every manufacturing establishment should have a card posted showing the maximum number of people permitted to work there. Stairways that wind around elevators should be ordered removed in existing buildings, and stairways and elevator shafts should be enclosed in fireproof walls. Fire walls should be ordered in existing buildings 75 by 80 feet, or larger.

*F. S. Tomlin:*

Smoking should be prohibited in factories and the penalty should be severe. The use of wooden or non-fireproof partitions in any part of a factory should be prohibited. Doors and sashes of windows leading to exits should be painted red, such sashes should be of metal, and windows leading to fire-escapes should be made of wired glass. No change should be permitted in any manufacturing establishment without the approval of the proper authorities. Fire drills should be made mandatory once a month. The penalty for locked doors in factories while employees are on the premises should be death.

Machines should be so arranged that there should be clear passageways of two feet between the people operating them.

The law should absolutely prohibit the use of any doors or shutters opening inwardly that lead to fire-escapes or exits, and the obstruction of the exits to fire-escapes by window sills. Outside fire-escapes should be constructed at or about the floor level of a factory, and there should be a standard of construction for outside fire-escapes. From the lowest balcony to the ground there should be a regular stairway 5 feet wide with 7-inch tread.

The number of people permitted to work in a factory should depend on the number and kind of exits, and this provision should be left to the Factory Commissioner. Every manufacturing establishment should have a card posted showing the maximum number of people permitted to work in it, and the name of the employer. It is most important that factories should be licensed for certain designated occupations and that changes in the nature of occupancy should be prohibited unless expressly authorized. Fire walls should be ordered installed in all existing buildings.

*F. H. Wentworth:*

Smoking should be prohibited in factories during working hours or at any time, except in smoking or rest rooms definitely set aside for this purpose. This should be a misdemeanor rather than a crime although I am open to conviction that this should be made a crime.

All partitions should be made of the non-combustible materials now available.

To prevent spread of fire because of inflammable material used in manufacture, divide floor areas as much as possible and equip all rooms with automatic sprinklers and other fire extinguishing devices. Employees should familiarize themselves with the location of exits. Sashes of windows leading to exits should be of metal, and windows leading to fire-escapes should be of wired glass. Any change in the interior of manufacturing establishments should be made only after the approval of plans.

Fire drills should be made mandatory. At the beginning rehearsals should be more frequent than after the drill is well learned. A co-operative drill is certainly desirable and not necessarily impracticable. The plan would have to rest with the

city official who would take the initiative, inaugurate the drills and conduct or superintend their initial operation. Separate and independent fire drills for manufacturing establishments in the same building would not have very much value, as employees of the different establishments would encounter one another upon the stairs and exits and no set would give precedence to the other without previous co-operative consent. The installation of automatic sprinklers should decidedly be made mandatory. All factories should be so equipped irrespective of the character of the industry, number of persons employed or location of factory. Auxiliary fire-alarm systems should be worked out and operated in connection with the system of fire drills. It would be better to notify by messenger.

A fire drill is imperative where a general fire-alarm system is operated.

Where there is no equipment of automatic sprinklers the automatic fire-alarm equipment is the next most desirable agent.

Manufacturing should be prohibited above the sixth story.

The penalty for locked doors in a factory should be heavy fines or imprisonment, or both.

There should be a clearance of four feet in aisles and two and one-half feet between machines placed in rows. The law should absolutely prohibit the use of any doors or shutters opening inwardly that lead to exits or fire-escapes, and the obstruction of exits to fire-escapes by window sills. I believe that the outside fire-escape is practically useless. The number of people permitted to work in a factory should depend upon the number and kind of exits provided. This provision should be left to a properly constituted authority. Every manufacturing establishment should have a card posted showing the maximum number of people permitted to work in it. The manufacture of devices using especially inflammable materials should be limited to designated locations. Existing stairways that wind around elevators should be ordered removed, existing elevator shafts and stairways should be ordered enclosed in fireproof walls, and in buildings 50 by 80 feet, and larger, dividing fire walls should be installed.

I believe the fire tower to be the only suitable fire-escape and that it should be ordered in all buildings in which a large number

of persons are employed. In factories of moderate size and occupancy the stairway enclosed in fireproof wall might be sufficient.

Elevator shafts and stairways enclosed in fireproof walls, fire towers in large buildings with many occupants, and where the processes are hazardous or quick-burning or inflammable material is used, floors should be divided by fireproof partitions.

It would be well for New York State to adopt a modern Building Code, following the recent example of the State of Ohio.

*H. B. Woolston:*

Buildings erected for one purpose should not be used for different kinds of work or occupancy without most stringent overhauling by one competent authority.

*Charles Yates and Edward V. Wood:*

Smoking in factories during business hours should be prohibited, and the use of wooden or non-fireproof partitions should be prohibited. The doors and sashes of windows leading to exits should be painted red, such sashes should be of metal, and windows leading to fire-escapes should be of wired glass. Fire drills should be made mandatory in all manufacturing establishments and the installation of a so-called co-operative drill for the employees of different establishments in the same building is practicable with proper organization under the Fire Chief of a city. Separate and independent fire drills for different establishments in one building would have no value. The installation of automatic sprinklers should be made mandatory in all factory buildings, regardless of the character of the industry, the number of persons employed, or the distance of the establishment above the street level. In hazardous trades the installation of an auxiliary fire-alarm system should be made mandatory. Such a system can be operated practically in a loft building by gongs automatically worked in hallways. In factories engaged in hazardous trades, such system ought to communicate with Fire Headquarters. Manufacturing above a certain number of stories should be prohibited. The penalty for locked doors while employees are on the premises should be imprisonment for life.



The clear passageway between machines should be sufficient to avoid danger. The law should absolutely prohibit the use of any doors or shutters opening inwardly, and the obstruction of exits to fire-escapes by window sills. Fire-escapes should be constructed at the floor level of factory. There should be a standard of construction for outside fire-escapes. There should be stationary stairways from lowest balcony to ground.

The number of people permitted to work in a factory should depend upon the number and kind of exits provided. This requirement should be made specific.

Every manufacturing establishment should have a card posted showing the maximum number of people permitted to work in it, and anyone reporting excess should be immune from punishment by the firm. Stairways winding around elevators in existing buildings should be ordered removed, and existing elevator shafts and stairways should be ordered enclosed in fireproof walls, and fire walls installed in existing buildings 25 by 80 feet, or larger. Fire towers should be ordered in existing buildings of three stories or over.

*H. R. Yates:*

Smoking should not be permitted during working hours in any part of a factory unless there is a room for that purpose and then the room should be so constructed as to contain concrete floors, concrete or brick walls and nothing of inflammable nature. Non-fireproof partitions should not be permitted and all doors between partitions should be of fireproof construction and when it is necessary to keep same open should automatically close in case of fire.

To prevent the spread of fire the following:

Metal cans with covers for all inflammable rubbish and rags.

An up-to-date sprinkling system.

A sufficient number of extinguishers.

Pails of sand.

Cleanliness.

Doors and sashes of windows should be painted red as well as signs over doors and exits.

Sashes of metal would be of some assistance.

The frame should be of metal and the glass of wired glass.

Changes in the interior of manufacturing establishments should only be permitted by approval of the proper authorities.

Fire drills wherever explosive and inflammable materials are kept should be held at least once a month. In other places they would be a detriment not only to the pieceworkers, but to the manufacturer as well.

Drills should be held directly under the jurisdiction of the owner or lessee. Separately conducted drills held would be a confusion of responsibilities.

Installation of automatic sprinklers should be made mandatory in all factories and manufacturing establishments.

The installation of automatic sprinklers should depend upon the character of the industry, the number of persons employed in the establishment, and the distance of the establishment above the street level.

Independent fire-alarm systems should be installed in such buildings over a number of stories in height and where inflammable material is kept and stored, especially in places where females and children are employed.

An alarm-box can easily be installed on the floor of a building that when operated would sound a vibrating gong in the loft and throughout the entire building.

Automatic fire-alarm systems connected with thermostats to sprinklers have never proven satisfactory.

Locked doors in factories while employees are on the premises should be a misdemeanor.

The proper spacing of machinery depends on conditions. It should be a misdemeanor to permit the use of doors or shutters opening inwardly that lead to exits or fire-escapes, and to obstruct the exit to fire-escapes by window sills. It should not be necessary to climb over a window sill in order to reach an exit. It is impossible to have a standard of construction for outside fire-escapes. From the lowest balcony to the ground there should be an iron stairway with proper hand rail.

The number of exits should depend upon the number of persons employed on each floor. This would have to be left to the proper authorities.

There should be a card posted showing the maximum number of persons allowed in accordance with the number of exits and when violated should be considered a misdemeanor.

Factories and loft buildings should by all means be licensed for certain designated occupations, and changes in the nature of the occupancy should be prohibited unless expressly authorized. Stairways around elevator shafts should be removed unless the elevator shaft is of fireproof construction. Existing elevator shafts should be ordered enclosed in fireproof walls. If there are proper fireproof exits it would seem an unnecessary expense to order the enclosing of existing stairways in fireproof walls. The installation of fire walls and fire towers in existing buildings depends on the construction of the building. Before being built a permit should be issued only for fireproof walls. Fire towers should depend on the material kept in buildings.

All buildings over two stories in height when occupied for any purpose except as a private residence should be provided with proper stairways and fire-escapes.

### MANUFACTURING IN TENEMENT HOUSES.

*S. M. Dix:*

Manufacturing in tenement houses should be restricted by penalty on owner. To prevent such employment, owners should be made responsible under penalty

*Dr. George W. Goler:*

Manufacturing in tenement houses should be absolutely prohibited. Where young children are found to work for a manufacturer at home, under a license system for the factory, this should be sufficient for the revocation of the license.

*Herman Grossman:*

I would absolutely prohibit manufacturing in tenement houses, but if a custom tailor takes out two or three coats from a store they should have absolutely separate rooms and those rooms be investigated by inspectors before a license is issued.

*A. S. Haight:*

Manufacturing in tenement houses should be forbidden absolutely for anything more than a sewing machine used by families.

*Benjamin C. Marsh:*

Manufacturing in tenement houses should be prohibited.

*Mrs. Frederick Nathan:*

Manufacturing in tenement houses should be prohibited.

*Dr. Delancey Rochester:*

Manufacturing in tenement houses should be prohibited entirely, especially the manufacturing of food stuffs.

*P. Tecumseh Sherman:*

Manufacturing in tenements should be restricted as it is. Young children are considerably illegally employed in manufacturing conducted in tenement houses in the lowest grade of work, but in the mass very little. Such employment cannot be prevented without serious oppression and harm.

*F. S. Tomlin:*

Manufacturing in tenement houses should be absolutely prohibited except on the first story, i. e., on a level with the street. To prevent the employment of young children illegally in manufacturing conducted in tenement houses, enforce the factory laws.

*Charles Yates and Edward V. Wood:*

Manufacturing in tenement houses can be restricted by stopping it entirely by law and making the penalty therefor so great that no one would attempt to evade the law.

## INDUSTRIAL COMMISSION.

*R. W. DeForest:*

There should be no permanent industrial commission. Whenever such a commission is needed it should preferably be appointed in reference to the particular need and exist only long enough to fill that need. Permanent commissions of this type tend to crystallization and immobility.

*S. M. Dix:*

There should not be a permanent industrial commission appointed to work in conjunction with the State Department of Labor. Let the Commissioner bear the responsibility and either make good or get out.

*Herman Grossman:*

I am in favor of a permanent industrial commission to work in conjunction with the State Department of Labor.

There should be an Industrial Commission. The Commissioner of Labor with his entire staff should be under the jurisdiction of the Commissioner of Industry and they should give this board full account before any report is given to the Legislature or Governor. This Industrial Commission should have the right to give orders to the Commissioner and always take account of every thing that goes on in every Department.

*Eugene L. Lezinsky:*

We believe in the establishment of a permanent industrial commission to work in conjunction with the State Department of Labor, and it should be made up of men and women to serve without pay, with a paid office staff and a sufficiently large budget to be provided by the State to enable the employment of experts in the different fields.

*Benjamin C. Marsh:*

I would suggest a Municipal Industrial Commission for New York city, such as proposed by the New York City Commission on Congestion of Population, on page 31 of its report.

*Mrs. Frederick Nathan:*

There should not be a permanent industrial commission appointed to work in conjunction with the State Department of Labor.

*E. A. Quarles:*

I am very much opposed to a permanent industrial commission. It would seriously interfere with the board of technical experts.

*P. Tecumseh Sherman:*

There should not be a permanent industrial commission appointed to work in conjunction with the State Labor Department.

*F. S. Tomlin:*

A permanent industrial commission appointed to work in conjunction with the State Department of Labor would be a useless duplication of offices.

*Charles Yates and Edward V. Wood:*

There should be a permanent industrial commission appointed by the Legislature and with absolute power, to work in conjunction with the State Department of Labor.

CONTINUATION SCHOOLS FOR MINORS EMPLOYED  
IN FACTORIES AND MANUFACTURING  
ESTABLISHMENTS.

*S. M. Dix:*

I advocate the establishment of continuation schools, measurably, but the matter is complex and should be very elastic to meet widely varying conditions, both physical and mental.

*Dr. George W. Goler:*

I am not in favor of continuation schools any more than I am in favor of burning the candle at both ends.

*Herman Grossman:*

The establishment of continuation schools should not be compulsory.

*Frederick L. Hoffman:*

I am heartily in favor of continuation schools. They should be organized as far as practicable along the lines which have proved successful in Germany and England. The minimum age required should be not less than 18, and I would go as far as 21, provided the attendance was limited to, say, three evenings a week.

*Dr. M. Loeb:*

Continuation schools are an immediate necessity, but for the study of this question a special commission should be organized and the requirements should be graduated in accordance with the industries concerned.

*Benjamin C. Marsh:*

Continuation schools should be organized, and attendance should be compulsory for at least two or three days a week, preferably in the evening. These schools should be for children between 14 and 16.

*Wm. H. Maxwell:*

Continuation schools should be established for the younger children employed in factories and manufacturing establishments in this city. They should be organized under the direction of the Board of Education. The compulsory attendance upon such schools should certainly go to 16, and quite probably to 18 years of age. The part of the day that should be devoted to such schools should be either 4 P. M. to 6 P. M. two or three days in the week, or 7 A. M. to 9 A. M.

*Mrs. Frederick Nathan:*

I advocate the establishment of continuation schools, with two shifts, morning and afternoon, for general education and vocational training.

*P. Tecumseh Sherman:*

I advocate the establishment of continuation schools.

*F. S. Tomlin:*

I unqualifiedly advocate the establishment of continuation schools.

*Charles Yates and Edward V. Wood:*

We advocate the establishment of continuation schools, organized by the school authorities, for children between 14 and 18 years of age, who shall attend half-time.

## GENERAL MATTERS.

*Chas. Grace:*

The plumbing and drainage systems of factories, as a general rule, are defective because of the fact that changes and repairs are continually made by some handy man around the factory, who is neither practical nor competent to do such work.

I would suggest that the Commission recommend that Art. 4, Chap. 26 of the General City Law be amended so that the pres-



ent examining boards would issue licenses to journeymen plumbers in the same manner that they now examine and issue licenses to master plumbers.

*Herman Grossman:*

I would advise this Commission to recommend to the Legislature that a sufficient fund should be appropriated in order that the State Department of Labor should go on with its work unhampered, as I think that this is one of the most important Departments for securing the safety of the public in general.

*Frederick L. Hoffman:*

I would suggest the extensive use of red paint to indicate dangerous parts of machinery or dangerous places generally, such as openings, etc. This rule is in general use throughout Germany, and manufacturers are required to paint the dangerous portions of machinery red in compliance with the safety requirements formulated on the basis of long experience by the Employers' Accident Insurance Associations.

A more qualified statistical analysis of the collected information by the Labor Department is advisable.

It would be advisable to incorporate in the annual reports a descriptive account of fatal or serious accidents involving questions of violation of law or suggesting improvements, or the introduction of safety devices for the prevention of similar accidents in the future.

The Annual Reports of the Department of Labor should be made to conform more to the admirable arrangement followed for many years in the reports of the Chief Factory Inspector of the United Kingdom.

*Dr. S. A. Knopf:*

We should increase the force of more technically trained factory inspectors.

Because of the prevalence of tuberculosis among garment workers, I would feel indebted to the Factory Investigating Commission if it would take up this matter as a subject for investigation.

*Benjamin C. Marsh:*

The location of factories in certain districts should be prohibited by local authorities of New York city.

*Mrs. Frederick Nathan:*

There should be more women factory inspectors. Women have great powers of observation, are faithful and give attention. Plenty of first-rate women would serve where first-rate men would seek, perhaps, other work.

It would be of interest to the Commission to visit candy factories and factories where seasonal overtime work is exacted.

*Chas. Yates and Edward V. Wood:*

It would tend to protect the operatives to prosecute those who evade the law to the fullest extent, and not as now, a half-hearted enforcement.

There is a woeful lack under the present law of securing a carrying out of the law. During the last year three specific cases have come under our observation wherein it was clearly proved that the law was being violated, and men placed in responsible authority have, by acts of omission, neglected to do their duty.

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**APPENDIX IX**

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**BRIEFS AND MEMORANDA SUBMITTED TO THE  
COMMISSION**

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# BRIEFS AND MEMORANDA SUBMITTED TO THE COMMISSION

## (1) FIRE PREVENTION, FIRE-ESCAPE FACILITIES AND BUILDING CONSTRUCTION:

### BRIEF ON FIRE PREVENTION AND PUBLIC SAFETY.

*By* RUDOLPH P. MILLER, *Superintendent of Buildings, Borough  
of Manhattan, New York City.*

*January 5th, 1912.*

HON. ROBERT F. WAGNER, *Chairman New York State Factory  
Investigating Commission.*

DEAR SIR:

In accordance with the request of your counsel, I submit the following brief on the subject of exit facilities for buildings, more particularly factories.

The statements and arguments offered herewith apply more especially to the problem as it is met in the city of New York, where the conditions are, in many respects, different from those in the country or suburban districts, or even in the smaller cities. Conditions in Manhattan Borough are even different from those in the other four boroughs. In the smaller cities and the boroughs outside of Manhattan, the availability of greater space makes the problem of proper exit facilities to buildings much simpler.

The question of adequate means of egress, like the old tenement-house problem and the congestion evil, has been allowed to grow unchecked. No blame for its present condition can be attached to any municipal department, for the law, so far as public opinion has sustained it, has been enforced. And this is not to be taken as an apology on the part of the Bureau of Buildings, as I say without hesitation that never before has the subject of proper exit facilities received the same attention as it does now, and even before the Triangle Waist Company fire. That unfortunate oc-

currence has merely caused the public to realize that there is a serious problem to deal with, although that case was really not so serious a one in the matter of exit facilities as many others that existed at the time of the fire.

Personally, I have given this subject much consideration. So far back as 1902 I called attention to the illogical basis for the present requirements for stairs and fire-escapes. As Chief Engineer of the Bureau of Buildings for some years, I endeavored, and often succeeded in securing in the new buildings better exit facilities and protection in case of fire than what was understood the law required, by having stairs enclosed when they might be open, by dividing buildings into sections, by the use of interior partitions and fire doors across corridors, and in one or two instances providing fire towers. As one of the Commissioners for the revision of the Building Code in 1907, I provided the section on fire-escapes, and for the first time inserted the provision for fire towers.

Since my appointment as superintendent I organized with such material as I had at my command, a force to take care of cases that needed attention. This has been done at the expense, to some extent, of the efficiency of the normal inspection force. My effort to secure the necessary additional help to get the force well organized and to restore the men assigned to this work to their former duties, did not meet with much success.

The law did not require any systematic inspection on the part of the Bureau of Buildings of existing buildings, and the force assigned to that work was only intended to handle the complaints that reach the Bureau through the State Department of Labor, the Fire Department, and other sources. The work of the force which I have, for convenience in administration, called the Public Safety Division of the Bureau, also included the inspection of all theatres, common shows, dance halls, and other places of amusement when requested by the Police Department or the Bureau of Licenses at the time of application for renewals of licenses, also the inspection of hotels for the Excise Department. The division, therefore, as now planned, would not be equal to the task of a systematic inspection of workshops or factories, but could very readily be enlarged to include such work.

No reliable information, so far as I am aware, exists as to the number of factories in the city of New York, or in any one of the boroughs. The State Factory Inspector's annual report gives the number of inspections made, but does not give information leading to an estimate of the number of factories. My own estimate, based on such information as is in the Bureau of Buildings, is that there are 20,000 buildings in Manhattan in which one or more workshops or factories exist. Thorough inspections, including the filing of reports and notices, and the necessary reinspections, cannot well be made at a greater rate than five or six per day. This would mean a force of about sixteen inspectors, and three clerks, to secure an annual inspection of factories and workshops. If, however, ample summary powers were given the Bureau, and the same were properly exercised, I am sure the work could be done with even a smaller force. More frequent inspection would, of course, require a proportionately larger force.

As I pointed out in 1902, so far as possible the necessary exit facilities to any building should be provided within the building itself. This is quite possible in the case of new buildings, but for the existing buildings in a closely built community like this borough, great difficulties are experienced in an effort to carry out this general principle. Resort must often be had to outside means of egress, and perhaps even to the unsatisfactory outside fire-escapes.

The means of enforcing whatever legal requirements are prescribed is all-important. The imposition of a penalty is not effective. To secure judgment it is necessary to start legal proceedings, which means delay and perhaps finally even a remission of the penalty. To collect the penalty after judgment is obtained, further action through the sheriff is necessary. Of about 170 penalties incurred in 1910 by failure to provide fire-escapes promptly when notified, judgments were obtained in nine cases only, but, so far as I know, collection has been made in none of these cases. Furthermore, the collection of the penalty does not yet secure a compliance with the order. In many instances a separate action must be started. A notable instance is the case of the new exits recently provided on the Madison Square Gar-

den. It was in March, 1902, that the order for the outside stairs was first issued. This order was superseded by another in 1907, and was soon after sent to the corporation counsel for prosecution. The stairs called for by this order were only erected in the early part of 1910 and judgment secured in March of the same year, which, so far as I have been able to learn, however, has not yet been paid. The general moral effect of such proceedings on other cases is practically nil.

Sometimes recourse is had, but only in flagrant cases, to a complaint under section 8 of the Sanitary Code, which brings the matter before a magistrate, who generally directs a compliance within a certain time, after which, if the work is done, the complaint is dismissed. Or, if the work is not done, he grants further delay or holds the offender for Special Sessions. All this again means delay and no general moral stimulus.

The provisions of sections 776 and 776-A of the recently enacted Fire Prevention Bill (chapter 899, Laws of 1911), under which the Fire Department may, upon the refusal or neglect of the responsible party to do so, "execute such order with its own employees or equipment, or by the employment of other agencies," and by which the expense becomes a charge against the responsible parties or a lien on rents and compensation due, will, in my opinion, not be effective, inasmuch as the responsible parties are not always reached and the lien may stand indefinitely. The lien may even prove uncollectable because of other incumbrances, a condition which did occur in the case of certain liens against property by reason of work done by the Bureau of Buildings under Precept in Unsafe Building cases. Even when the liens are collectable, the method will not have any great effect in securing prompt compliance in other cases. In fact, it is likely that this method would lead the city into the construction business and tenants and owners would often rely on the work being done in this way. Tenants whose leases had only a short time to run would be particularly prone to delay the payment of liens in the hope of ultimately saddling it on the landlord.

The most effective way, in my opinion, to secure prompt compliance with orders, is to confer on the administrative authority



summary powers to vacate and shut up any manufacturing building, or part of building, until the necessary work has been done to make it safe. To guard against a misuse of this power, it would be well to provide for an appeal to a board of survey, as proposed in the Herrick bill, passed by the recent Legislature, but vetoed by the mayor. Such an action need be taken in only a few instances to secure a prompt compliance in practically all cases. It would also mean that the inspection force would not be so large as otherwise, as reinspections would not have to be so frequent.

The problem of providing adequate exit facilities divides itself into two parts, exits from buildings hereafter erected and exits from existing buildings. Provision for proper facilities for new structures is not difficult to obtain. The present requirements should, however, be supplemented by a few additional general requirements, basic in character, not too specific, but more definite than the present ones. Although the powers of the Superintendent of Buildings were very broad, he lacked the support of public opinion in the enforcement of requirements not specifically given in the law. The architect, builder or owner who is asked to put in additional stairs, or to enclose such as he does provide, has pleaded past practice for their omission. The authority to promulgate detailed regulations to meet the many and varied conditions that arise from time to time and cannot be specifically provided for in any law, should be conferred on the administrative officer. Such power should, however, be safeguarded by requiring all such regulations to be published for some time and an opportunity offered for a hearing, if requested, before the same shall be effective. The power to issue regulations should, of course, apply to existing buildings as well as new structures.

The present Building Code, in section 75, provides that the number of staircases in stores, factories, hotels and lodging-houses, shall be proportioned to the area of the buildings, irrespective of the height or number of stairs, or the number of occupants. This is illogical. Exit facilities, including number and width of doors, stairs and passages, should be proportioned to the number of persons to be accommodated. As the necessity for them increases, the stairs should increase in number and width. That is, in each succeeding story from the top down, the stairs should be

proportioned to the number of occupants above that particular flight. The requirements which I consider fundamental and which should be incorporated in the law governing mercantile and public buildings are as follows:

NO DOOR, STAIR OR PASSAGEWAY SHALL BE LESS THAN THREE FEET FOUR INCHES WIDE IN THE CLEAR.

This will allow two persons, of average size and weight, to walk abreast without delay.

AT LEAST TWO SEPARATE STAIRCASES, WITH THE NECESSARY DOORS AND PASSAGEWAYS, SHALL BE PROVIDED FOR ANY BUILDING OVER THREE STORIES IN HEIGHT OR OVER 3,000 SQUARE FEET IN AREA.

The necessity for at least two separate and distinct means of egress from any place where a large number of persons is liable to congregate seems to me self-evident. Whether the limitations here specified are the best is, of course, a matter of judgment. Personally, I believe three stories the proper maximum height for one staircase, and this is also in a measure recognized by the Labor Law (section 82). It may, however, considering the height limitation, be fair to extend the limit of area to something more than 3,000 square feet.

WHEN MORE THAN ONE IS REQUIRED, THE STAIRS SHALL BE SO PLACED THAT AT LEAST ONE IS ALWAYS ACCESSIBLE TO THE OCCUPANTS IN CASE ANY ONE OF THE OTHERS IS RENDERED IMPASSABLE FOR SOME REASON, AND THAT IT WILL NOT BE NECESSARY TO TRAVEL MORE THAN EIGHTY FEET IN A DIRECT HORIZONTAL LINE TO REACH EITHER ONE OF ANY TWO.

This provision would fix the minimum number of staircases for any building requiring more than one. Its effect would be to require more than two staircases in any building of greater area than 6,400 square feet and an additional stairs approximately for every 6,400 square feet in excess of 6,400 square feet. These would be maximum conditions. Practically, in smaller buildings, the number would be proportionately larger, because of some of the difficulties that would be met in placing them to receive the

greatest floor area per staircase. The proportion would be about the same as it is under the present law (section 75, Building Code).

EVERY STAIRS SHALL BE ENCLOSED IN AN APPROVED FIRE-PROOF CONSTRUCTION AND SHALL HAVE A DIRECT EXTERIOR OUTLET TO THE STREET OR TO A COURT LEADING TO A STREET, AT THE GROUND FLOOR.

The enclosing of the stairs as here provided is of utmost importance. The stairs, under these provisions, being made, as they should be, the means of exit, would afford those using them the best possible protection. Those from the upper stories may be compelled to pass a lower story in which there is fire. It would be well to have the stair construction also fireproof, but that is not so essential if they are substantially enclosed. As far as possible all stairs should be constructed as fire towers (as described further on). The value of such enclosures is illustrated in a fire that occurred in the Trinity Building a few years ago. The wire insulation started burning, causing a very dense smoke, none of which, however, reached the stairs, though located close to the fire, because of the substantial enclosure around the stairs. On the other hand, in the Morton Building fire, the smoke from a fire on the second floor passed through the entire building by way of the unenclosed stairs, cutting off the safe escape of those (fortunately few) who happened to be in the upper part of the structure.

THE RISERS AND TREADS OF STAIRS SHALL BE SO PROPORTIONED THAT THE STAIRS FURNISH A SAFE AND COMFORTABLE LINE OF TRAVEL. THE RISERS SHALL NOT EXCEED  $7\frac{1}{2}$ " IN HEIGHT AND THE TREADS SHALL BE NOT LESS THAN  $9\frac{1}{2}$ " WIDE, EXCEPT THAT WINDING TREADS HAVING A MINIMUM WIDTH OF 6" AT ONE END AND AN AVERAGE WIDTH NOT EXCEEDING  $9\frac{1}{2}$ ", MAY BE USED WHERE STRAIGHT RUNS ARE IMPRACTICABLE OR UNDESIRABLE. ALL TREADS OTHER THAN WINDING TREADS AND RISERS SHALL BE OF UNIFORM DIMENSIONS IN ANY ONE FLIGHT.

The limiting dimensions given here are a departure from present requirements, but are proper and desirable. It will be noted that

they comply with all the conditions for safe and comfortable stairs given by Kidder in his "Architects' and Builders' Pocketbook" (p. 1476, Ed. 1908), as follows:

"\* \* \* For ordinary use a rise of 7 to  $7\frac{1}{2}$  ins. makes a very comfortable stair. \* \* \* Stairs having a rise greater than  $7\frac{3}{4}$  ins. are steep.

The width of the run (tread) should be determined by the height of the rise; the less the rise the greater should be the run, and *vice versa*. Several rules have been given for proportioning the run to the rise, viz.:

(1) The sum of the rise and run should be equal to from 17 to  $17\frac{1}{2}$  inches.

(2) The sum of two risers and a tread should not be less than 24 nor more than 25 inches.

(3) The product of the rise and run shall not be less than 70 nor more than 75."

The existing Building Code does not provide for limiting dimensions of treads and risers, except in theatres. For these buildings the requirements are  $7\frac{1}{2}$ -inch risers and  $10\frac{1}{2}$ -inch treads for interior stairs and  $8\frac{1}{2}$ -inch risers and 9-inch treads for exterior or emergency stairs. It is difficult to understand why a difference should be made, as both types of stairs are for the safe egress of the audience. Curiously enough, this precedent has been followed in the proposed Building Code revision of 1907, 1909 (majority and minority) and 1911 in the theatre section only. For stairs in other buildings all three revisions propose 8-inch risers and 9-inch treads. The Labor Law does not cover this point. The Tenement House Law provides for 8-inch risers and 10-inch treads. None of these cases cited complies with all the rules given by Kidder.

Winders have been generally condemned, though the Tenement House Law (section 17) permits their use where a power passenger elevator is provided, on condition that the treads shall be at least ten inches wide at a point eighteen inches from the strings on the well side. There are circumstances where the prohibition

of winders would probably be a decided hardship. The form of winder allowed by the Tenement House Law is not safe where many people must use a stair. The form which I have suggested above is safe.

NO FLIGHT OF STAIRS SHALL HAVE A VERTICAL RISE OF MORE THAN TWELVE FEET BETWEEN FLOORS OR INTERMEDIATE PLATFORMS; AND IN STRAIGHT RUNS PLATFORMS SHALL BE SPACED EQUIDISTANT BETWEEN UPPER AND LOWER LIMITS.

This provision has been recommended by every commission or committee that has considered the revision of the Building Code. Its necessity is practically self-evident. While too short runs, especially where frequent, are not desirable on account of confusion produced by repeated change in direction, the long runs, on the other hand, are dangerous because of the greater length of stair probably affected by a chance slipping on any part of the flight.

THE AGGREGATE CLEAR WIDTH OF DOORS AND PASSAGEWAYS INTENDED TO SERVE AS EXITS FROM ANY BUILDING OR PART OF A BUILDING SHALL BE AT LEAST TWELVE INCHES FOR EVERY TWENTY PERSONS TO BE ACCOMMODATED, PROVIDED NONE IS LESS THAN FORTY INCHES WIDE.

The purpose of this requirement is to secure adequate exit facilities from each and every enclosed space. It would, at first thought, seem an unnecessary provision, as it is so self-evident. And yet past experience shows that in many cases a single narrow door has been assumed to be sufficient, though a large number of persons were relying on it for safe egress. The width has been arbitrarily fixed at 12 inches per twenty persons. It is not as much as is later suggested for width of stairs; but as this provision applies only to exits along level surfaces on which progress can be much more rapid than on stairs, it would seem adequate. Generally speaking, it provides about half the proposed width of stair facilities.

THE AGGREGATE CLEAR WIDTH OF STAIRS AND STAIR HALLS SHALL BE SUCH THAT THE STAIRS IN ANY STORY OF A BUILDING

MAY ACCOMMODATE AT ONE TIME THE TOTAL NUMBER OF PERSONS ORDINARILY OCCUPYING OR PERMITTED TO OCCUPY ANY ONE FLOOR ABOVE THE FLIGHT OF STAIRS UNDER CONSIDERATION, ON THE BASIS THAT AT LEAST TWENTY INCHES OF WIDTH AND ONE AND ONE-HALF TREADS ARE REQUIRED PER PERSON.

This is a very drastic provision, and will undoubtedly meet with strenuous and perhaps overwhelming opposition. But if a prompt and complete evacuation of the building is considered necessary for the safety of the occupants, then heroic treatment must be applied and this requirement, as drawn, is to my mind the only solution, unless other safeguards, to be discussed later, are inaugurated, in which case the requirement may be much modified. The theory on which this provision is based is that it is necessary to provide such adequate stair facilities that every occupant can leave his place at the first note of alarm, pass along the most direct means of exit and get out of the building without delay. It assumes that the character of the construction does not affect the safety of the occupants, that is, that the occupants must be taken out as quickly from a fireproof building as from a non-fireproof building. The contents being generally combustible, will burn as readily in the one type of construction as in the other. The only advantage that the fireproof construction has over the non-fireproof is that the chances of fire in the former are smaller in the proportion that the number of fires originating in the structural parts of buildings bears to the total number of fires originating in structure or contents. It might be argued that some allowance should be made when the contents are of practically incombustible character, such as hardware, china, etc., but there is always combustible furniture or packing that will furnish fuel. It would be exceedingly difficult to draw a line between combustible and incombustible contents. It is also practically impossible to limit the use of factory buildings to certain special industries in localities undergoing industrial changes. Then, too, the liability of panic, without fire, must be considered.

The time required, under this provision, to empty a building of its occupants will be that required for any one to go from the top story by means of the stairs to the outside of the building at the

ground floor. This would, of course, vary with the height of the building. The only information based on actual trial that I know of is given by Mr. H. F. J. Porter. He found that it took six minutes to pass through a twelve-story building from the top floor to the ground, or an average of about 30 seconds per story. Quicker egress may, of course, be possible where there is no obstruction or congestion, but considering the stairs completely filled with people, progress at the rate of two stories per minute may be considered very liberal. There is a suggestion here whether it would not be wise to prohibit factories in buildings over eight stories high; that is, to such as could be emptied in four minutes or less.

There is a weak point in the preceding argument, namely, the assumption that all occupants will start to leave the building at the same moment. Unless there is a simultaneous exit of all the occupants, congestion is sure to occur; thus, for instance, if the occupants of the fifth story of a building should fail to move at the same time that the occupants of the sixth and upper stories do, when they actually do start they will conflict with the occupants of the sixth story, who will have proceeded down the stairs and will have occupied in whole or in part the flight of stairs from the fifth floor down. The more general throughout a building the irregularity of starting is, the greater the congestion or confusion is likely to be. The difficulty could be met by providing separate stairways for each and every floor; a solution that is practicable only in localities where floor areas are not limited and buildings stand isolated so that ample exit at ground level can be provided. Another solution would be had by compelling the use of fire alarms throughout, so arranged that all parts of the building would be notified at the same time. This, supplemented by proper fire drills, would, I believe, meet the difficulty. The very drastic character of the provision would be best illustrated by a few examples:

1. In a twelve-story mercantile building recently erected, having a floor area of a little more than 16,000 square feet in the upper stories, it was found by actual count that the number of occupants varied from 5 to 175 on the several floors. Under the

proposed provision, four staircases each 5 feet wide and one 3 feet 4 inches wide, would be required through the second, third and fourth stories.

2. In a twelve-story mercantile building, covering a floor area of little more than 5,000 square feet, the number of occupants was found to vary from 8 to 85 per floor, requiring, by the proposed provision, one staircase 5 feet wide and two staircases 3 feet 4 inches wide from the second to the eighth stories, inclusive.

3. In a twelve-story loft building, covering an area of about 3,600 square feet, the number of occupants was found to vary from 7 to 80 per floor, requiring one stairway 5 feet wide and two stairways 3 feet 4 inches wide in the second, third and fourth stories.

4. In a twelve-story loft building covering an area of a little less than 10,000 square feet, the number of occupants was found to vary from 40 to 300 per floor, requiring in the fourth and fifth stories seven staircases 5 feet wide and two staircases 3 feet 4 inches wide, the lower stories in this building being higher than those above. The number of staircases was less by one 5 feet stairway below the fourth story, as the flights were longer and could accommodate more people.

5. In a twelve-story loft building covering an area of a little less than 14,000 square feet the number of occupants was found to vary from 9 to 200 per floor, requiring by the above provision five 5 feet wide stairways from the eighth story down. In this particular building the 200 employees were found on the ninth floor, whereas the highest number in any other story was 60 on the tenth floor. Because of this large number on the ninth floor, five wide stairways would be required under the proposed provision.

At first glance, these figures seem absurd. Yet a careful consideration of the conditions to be met can lead to no other conclusion. The result would be to prohibit altogether the crowded factory, or to force the inauguration of other safeguards which



would justify considerable reductions in the widths of stairs. Such allowances are suggested in the following proposed provision. Before passing on to them, however, it may be well to give a little further consideration to the figures suggested here for the basis of the calculations for determining the stair capacities. It has been at times proposed to increase the width of stairs by inches over a fixed minimum, in proportion to the number of people to be accommodated over and above a certain number considered as the capacity of stair of minimum width. This was based on observations by the Public Service Commission of the number of persons passing a point on a stairway within a certain time. These records show that on stairways more than 4 feet wide, thirteen persons passed one point per minute for each foot of width of stair. This information is hardly applicable to buildings, however, as it is not continuous streams of people that are to be provided for, but a mass of people which must be moved all at once. A stair 3 feet 4 inches wide is considered suitable for two persons walking abreast; that is, 20 inches each. A stair slightly wider, say 3 feet 10 inches, will, because it allows of greater freedom of motion, have a somewhat greater capacity, but it is not until a width three times 20 inches, or 5 feet, is provided that three persons can walk abreast. In the direction of travel the allowance made is one and one-half treads. The minimum width of tread being fixed at  $9\frac{1}{2}$  inches, the allowance per person becomes  $14\frac{1}{4}$  inches as a minimum, a not too generous allowance for the average adult for safe progress.

There is an advantage, not above referred to, in a fireproof building over a non-fireproof building, that, if the construction is thoroughly fireproof, if vertical openings are eliminated, all openings to the outer air are protected by approved metal and wire glass windows or doors, and if stairs are enclosed in so-called fire towers, fire cannot spread from floor to floor with any rapidity, and the occupants of such parts of the building as are not afire are quite as safe as those in an adjoining building separated only by a thin, but fireproof, party wall. Under such circumstances a reduction in width of stairs, from the above, could be permitted as follows:

WHEN THE BUILDING IS OF THOROUGHLY FIREPROOF CONSTRUCTION, WITH NO COMMUNICATION FROM FLOOR TO FLOOR EXCEPT BY ELEVATORS IN SOLID FIREPROOF ENCLOSURES AND STAIRS IN FIRE TOWERS CONSTRUCTED AS HEREIN ELSEWHERE DESCRIBED, AND ALL OPENINGS TO THE OUTER AIR ARE PROTECTED BY METAL AND WIRE GLASS WINDOWS OR DOORS OF APPROVED CONSTRUCTION, A REDUCTION OF TWENTY PER CENT IN THE AGGREGATE WIDTH SPECIFIED MAY BE MADE.

Of greater importance than fireproof construction as a safeguard is an efficient means of extinguishing fire in its incipency. For this purpose there is nothing better than a well designed automatic sprinkler equipment. Properly arranged and systematically inspected it has been described as "the greatest economic system of the age." Fully ninety per cent of the fires in building equipped with automatic sprinklers have been effectively held in check or extinguished in incipency. It is stated that "to-day their value is so well appreciated that churches, hotels, steamboats, department stores, theatres, asylums and like establishments where large numbers of people congregate, are protected with automatic sprinklers, as much, in many instances, for safety of the lives of the people as the loss of property by fire." The same authority describes them as "the best known preventive of fire and loss of human life from fire." There can be little doubt of the truth of these claims when they refer to properly installed and carefully supervised equipments. The efficiency of sprinklers depends much on their maintenance. As it is difficult to insure that through legislation, as large an allowance as would seem to be justified by the statements made cannot be granted. Their use in any building would, however, justify the following provision:

WHEN AN APPROVED EQUIPMENT OF AUTOMATIC SPRINKLERS IS INSTALLED IN ANY BUILDING, A REDUCTION OF TWENTY-FIVE PER CENT IN THE AGGREGATE WIDTH SPECIFIED MAY BE MADE.

The best safeguard, and the one for which the greatest allowance can be made, is the "fire wall," which consists of a substantial partition through the building, so arranged and provided with doors that all the occupants of any one part of a building

may, by quickly passing through the doors, be protected against the fire and smoke that may be raging in that section which they left. Its great advantage is its permanency after it is once erected, inasmuch as it cannot easily be removed without being noticed, and its removal would require official sanction. The wall must be of such strength and fire resisting construction that it will serve as a barrier during a fire for at least thirty minutes so that those depending on it can leave the protected section without undue hurry or excitement. The only openings permitted in this wall should be the necessary door openings to provide adequate facilities for exit from one section to the adjoining. These openings should have the same aggregate width as specified above for exits generally, but none should be more than 8 feet in width or 9 feet in height. The doors on the openings should be of such design and construction that when closed they will withstand fire without failure for at least thirty minutes; if arranged to stand open for any time they must be provided with such devices that will cause them to close automatically in case of fire and yet will not interfere with closing them by hand at any time. In non-fireproof buildings such walls should be of brick at least 8 inches thick, increased in thickness according to height and unbraced length. In fireproof buildings such walls should be of brick, concrete or terra cotta at least 8 inches thick or reinforced concrete at least 3 inches thick if of stone concrete and 4 inches thick if of cinder concrete. Each section formed in a building by such walls must be provided with at least one staircase. Some supervision and inspection of these fire walls is also necessary. It is important to know that the doors are in working order. To make sure of this it would be well to require the closing of them at the close of business each day. It is necessary, too, to keep the openings unobstructed so that the doors can close at any time. All occupants should be instructed how to shut them by hand and to do so when need for their use arises. Under these circumstances a liberal reduction in stair widths may be made as follows:

**WHEN FIRE WALLS, OF SUCH STRENGTH AND CONSTRUCTION AS TO RESIST FIRE FOR AT LEAST THIRTY MINUTES, EQUIPPED WITH ADEQUATE OPENINGS PROTECTED BY APPROVED AUTOMATIC**

FIRE DOORS, ARE PROVIDED, A REDUCTION OF THIRTY-THREE AND ONE-THIRD PER CENT IN THE AGGREGATE WIDTH SPECIFIED MAY BE MADE.

The effect of the provisions here outlined would be to practically prohibit the use of tall buildings for stores, workshops or factories, etc., where large numbers of people are employed, unless the same are of fireproof construction and equipped with fire towers, automatic sprinklers and fire walls, or some of them. These several allowances would make it possible to reduce the required widths of staircases to such an extent as to make them practicable. If all of these provisions were made in all buildings cited above, the staircases would in all cases be reduced to such an extent that only the minimum number of minimum width would be required in the five examples cited.

The provision of adequate facilities in the case of existing buildings is not so simple a matter unless handled in a drastic manner. The importance of it, however, would justify the severest requirements. If it were possible, the use of existing buildings for store, workshop, factory or similar purposes, should be prohibited unless the buildings are provided with the exit facilities hereinbefore specified for new buildings. This would mean, however, the abandonment of the majority of buildings now in use for such purposes and the compulsory equipment of practically all the remainder with automatic sprinklers or fire walls and enclosing of open stairways. Something, however, must be done to improve present conditions. If the specific requirements outlined above cannot be applied, only general requirements can be laid down, as the problem varies so much in the many cases to be considered. The following principles which for some time past have served as a guide in the Bureau of Buildings of Manhattan, may furnish a basis for more definite requirements:

"In any existing non-fireproof building more than three stories in height, used for business purposes above the first story, where the exit facilities are inadequate, additional safeguards must be provided.

"First, by the construction of an interior wall of fireproof construction, properly supported, dividing each and every story into

two or more sections, and having the necessary openings equipped with fireproof doors; or

“Second, by the enclosure of existing stairways and entrance halls in suitable fireproof construction, properly supported, with fireproof doors in the openings; or

“Third, by providing a safe and suitable outside iron stair construction, with direct access to the street.

“In existing fireproof buildings, where the exit facilities are found to be inadequate, proper provision shall be made by the enclosure of open stairways, the use of self-closing fireproof doors across the corridors; and the construction of interior partition walls of fireproof construction, having the necessary openings provided with fireproof doors.”

Bridges across yards or courts from one building to another are to be highly commended.

Outside fire escapes, so-called, are not to be considered satisfactory, and should be resorted to only in extreme cases where it does not seem possible to do anything better. They should be of substantial construction, of ample dimensions, and equipped with a well-designed balanced stairway to the ground.

All outside fire-escapes are open to the following objections: Inmates are not accustomed to their use and do not generally seek them except as a last resort. They do not allow of a quick and ready means of escape, as persons are unaccustomed to them and will move along slowly, thus delaying those who are following. In wintry weather they are liable to be obstructed by snow and ice, and when covered with sleet or ice become unsafe and dangerous. Very often they are rendered useless because of smoke and flame issuing from the windows at which they are placed. The means of getting from the lowest balcony is generally the least satisfactory of the entire equipment, and being at a point where it is most needed greatly delays quick egress. They are liable to be blocked by being used as storage platforms, and no amount of inspection can entirely prevent this in the crowded districts. Nu-

merous instances may be found in the public press in which inmates seeking fire-escapes have failed to know what to do and have waited for the Fire Department to come and take them down. On account of their contracted dimensions, large persons have sometimes found difficulty in making proper use of them. The Fire Department has generally advocated their use, but it will be found that this advocacy is based on a desire to have a means of getting into the building; but if desirable for this purpose, then they should be provided as such and not offered to the inmates as a satisfactory means of egress.

Having provided for adequate exit facilities in buildings for particular conditions of occupancy, it becomes necessary to guard against changes that would impair the safeguards prescribed. The most effective way, applicable to both new and existing buildings, is to limit the number of persons permitted to occupy a building at any one time to that which can be accommodated by the stair and exit facilities calculated by the rules prescribed herein for new buildings. As the law now requires (sec. 132 of the Building Code) the determination and posting of the safe-carrying capacities for all floors where heavy materials are stored, or machinery is introduced, so it should provide for the calculation by the rules outlined above of the number of persons to be accommodated in any building where manufacturing is done or where large numbers of people are liable to congregate. Heavy penalties, vacation of the premises, should be prescribed for any excess of the allowable limit. A somewhat similar provision was suggested during the past year by a Commission of Experts organized by the New York American restricting the use of buildings in whole or in part for commercial or manufacturing purposes to not more than twenty-five persons on one floor at any one time unless the building were equipped with certain exit facilities as described. The suggestion was proposed as an amendment to sec. 103 of the Building Code, and as it has much to commend it I attach a copy to this brief. The main objection to the amendment as proposed is that it is not sufficiently thoroughgoing.

A defect in our present law, and one that vitally affects the matter under consideration, should be remedied by prohibiting the occupancy of any new building until a certificate is obtained from

the Bureau of Buildings designating the purpose for which the building was designed and may be used, and the number of people to which each floor is limited by the exit facilities. Coupled with this provision there must be another making it unlawful to occupy any building in a manner other than specified in the certificate of occupancy. It is possible under the present law to secure a permit for one kind of a building and to use that building for an entirely different purpose provided no material alterations are made after the building is completed. Even minor changes such as the erection of partitions, according to the Corporation Counsel, do not require a permit from the Bureau of Buildings, and hence do not make a change of occupancy unlawful. To bring existing buildings also under the operation of these requirements, it should be provided that wherever alterations, repairs or enlargements of such buildings are made or intended, permits for such changes shall not be granted until certificates of occupancy shall first have been obtained, permitting the building to be occupied in the same manner as it was last occupied continuously for at least six months previous to the application. This is necessary, as it happens not infrequently that in order to avoid making certain changes required by law in the alteration of a building, the occupancy is changed just before the application for the alteration is made.

It should further be provided that as soon as practicable all owners of existing buildings shall file applications for certificates of occupancy for such use as the building is put to at the time of the application or its last actual use. To complete these requirements as to occupancy, it should be provided that no change in occupancy shall be made hereafter without first obtaining a proper certificate, and no such certificate shall be issued unless the building complies with or shall be made to comply with all the legal requirements for the proposed new occupancy.

The establishment of fire drills is a matter worthy of some consideration. It seems to me, however, to lose its importance, if adequate exit facilities and other safeguards have been provided. Wherever it is possible to do so, an organized fire drill will no doubt serve an excellent purpose. But in the case of factories, the difficulties of such drills are more than proportionately increased with the number of separate concerns occupying any building, until

in very many cases it becomes a matter of practical impossibility. What can and should be done, however, in all factories is the instruction, by posted notices, by circulars, by repeated oral announcements, etc., of all employees and occupants as to the location of exits, stairs, the use of safeguards against loss of life by fire, the means provided for the extinguishment of fire and all other matters that will aid in saving life or avoiding panic. The testimony of many of the workers in the Triangle Waist factory would seem to indicate that a very large proportion of factory employees do not know what is provided for their safety.

By the enactment of the so-called Fire Prevention Bill, Chap. 899, Laws of 1911, the recent Legislature has transferred the jurisdiction over exit facilities to the Fire Department, treating it as a matter of fire prevention. This I consider a mistake, the evil effects of which are not yet apparent, but will undoubtedly appear later when the new bureau is organized. The introduction of adequate exit facilities into new buildings is a matter so closely related to the design and construction of the building that it should come within the jurisdiction of the same official who administers the Building Law. The hardship inflicted on an owner or builder, by the ordering of exit facilities by some other authority than the Bureau of Buildings, may be indicated by an illustration. A new building is to be erected, let us say, for factory purposes. Plans are submitted as required by law to the Bureau of Buildings. The exit facilities are arranged as the applicant understands the law. Perhaps they are amended and re-arranged to meet the objections of the Bureau of Buildings. The building is erected in accordance with the approved plan, and is occupied. The Fire Department inspects, and in its judgment requires additional exit facilities. Can any builder or owner be sure that he won't have to rebuild or enlarge when he is erecting a new structure? Or, again, in an existing building additional facilities are called for. To provide them alterations in the building are necessary and plans are filed with the Bureau of Buildings. It is possible that in the examination of the plans that, for structural reasons, they are impracticable, or perhaps even only very expensive. A modification of the plans could make the work quite possible without sacrificing safety. The Bureau is without authority to permit changes in the other Depart-



ment's orders. The necessary passing back and forth between the two Departments, would not only be troublesome to both Department and the applicant, but would also mean additional delay in providing the exit facilities. Besides, the responsibility over the work is not so readily placed as when only one Department has jurisdiction.

The difficulties here illustrated might be endured if any advantage were obtained by the double authority. The Fire Department has not at the present time the force to handle this work, and must organize a force to do it. It is less trouble for the Bureau of Buildings to do the same thing, with the advantage that its past experience in this kind of work fits it better for a proper enforcement of requirements.

In summarizing, I wish to emphasize the following points:

Radical measures, putting to test the courage of your Commission, are necessary for a proper solution of the question of the safety of factory workers and others against fire.

Systematic inspection to see that safe conditions are maintained should be provided.

Ample authority should be given to the administrative officer to secure compliance with the provisions of law.

The necessary exit facilities and physical safeguards should be prescribed in sufficient detail to fix a safe standard.

The number of occupants should be limited by law in accordance with the exit facilities provided.

The occupancy of a new building or the change of occupancy of an existing building should be prohibited until a certificate has been issued by the proper authority.

Fire drills, or at least adequate instructions to employees as to safeguarding life, should be demanded in all workshops and factories.

The jurisdiction over exit facilities and inspection in connection therewith should be vested with the same officials that administer the Building Law.

Appended hereto are tables, abstracts, etc., that may have some bearing on the subject-matter discussed in this brief.

Respectfully,

**RUDOLPH P. MILLER,**

*Superintendent of Buildings.*

## NOTE I.

EXTRACT FROM A PROPOSED ORDINANCE RECOMMENDED BY A  
COMMISSION ORGANIZED BY THE NEW YORK AMERICAN.

In no building now erected or hereafter to be erected, used either in whole or in part for commercial or manufacturing purposes, shall more than twenty-five persons be employed or permitted to work at any one time on any floor above the second story from the street unless such building shall be provided and equipped with two independent means of exit from each floor, which two independent means of exit shall either be provided in one or more of the ways hereinafter described as (A), (B) and (C).

(A). On each floor above the fifth story there shall be a passageway from such building to another contiguous or nearby building, by means of outside balconies or bridges, and at least two windows opening upon each such balcony or bridge shall extend down to the floor.

(B). Building shall be divided from cellar to roof into two or more sections by the erection of fire-resisting walls or partitions, and each section shall have its own separate stairs from roof to ground and at least four feet wide, with treads not less than seven inches wide in the narrowest part. Access from one section to another at each story above the ground floor shall be provided by outside balconies or through fireproof vestibules. No partition shall be erected within five feet of exit doors leading to stairways or elevators.

(C). Buildings shall be equipped and provided with a stairway completely surrounded from top to bottom by fire-resisting materials, reached at each story only by outside balconies or bridges, and having an outside doorway at the ground. Such stairways shall be built either within the building or in turrets or towers attached to or separate from the building, or, when such safety stairway follows a blank wall and is, in the judgment of the Fire Commissioner, sufficiently distant from windows, it may be enclosed by a wire

netting. Such stairways shall be at least four feet wide, with treads not less than seven inches wide in the narrowest part. Inclined spiral chutes may be substituted for stairways in such turrets or towers.

## NOTE II.

### SPECIFICATIONS FOR FIRE TOWERS.

Fire towers shall have their walls constructed of brick not less than eight inches thick, or reinforced concrete not less than six inches thick. Such towers shall have no direct connection with the interior of the building, but access thereto from the building shall be had on every floor through outside balconies or through fireproof vestibules, such vestibules opening on a court not less than 24 square feet in area. Such outside connecting balconies and vestibules shall be at least as wide as the requisite exit width which they serve but in no case less than 40 inches wide clear of all obstructions and shall be built of non-combustible materials and shall have solid doors and substantial rails. Such balconies or vestibules shall be level with the floors and the platforms of stairs they serve. Where vestibules are used to connect to smokeproof stair towers there shall be self-closing fireproof doors separating such vestibules both from the building and from the stairs.

## NOTE III.

### FIRE-ESCAPES HANDLED BY THE BUREAU OF BUILDINGS OF MANHATTAN SINCE ITS ORGANIZATION IN 1902.

Year	Fire Escape Cases filed	Complied with	Corporation Counsel
1902. . . . .	1,711	3,707	810
1903. . . . .	1,025	1,409	167
1904. . . . .	532	621	208
1905 . . . . .	341	376	114
1906 . . . . .	418	196	12
1907. . . . .	701	564	178

Year	Fire Escape Cases filed	Complied with	Corporation Counsel
1908. . . . .	922	1,172	361
1909 . . . . .	496	565	287
1910 . . . . .	872	821	241
1911 . . . . .	438	162	91
(Jan. 1-Mar. 25)			
1911. . . . .	3,128	1,317	296
(Mar. 25-Oct. 19)			
1911. . . . .	287	553	140
(After Oct. 19)	<u>          </u>	<u>          </u>	<u>          </u>

The information with regard to the cases filed in 1911 is given in the form as shown to comply with the request of the Commission. The Triangle Waist fire occurred on March 25th, and the cases filed up to that point are given apart from those filed later. On October 19th the new Fire Prevention Law went into effect. The Corporation Counsel has advised that all cases filed after that date by the Bureau of Buildings are without authority of law and invalid. The 287 cases filed after that date were filed because the Bureau was not advised until the latter part of November of the effect of the law and it was felt that the activities of the Bureau should not be lessened until it was definitely known what authority still remaining with the Bureau over exit facilities.

#### NOTE IV.

#### STATEMENT OF FIRE-ESCAPE ORDERS PENDING IN THE BUREAU OF BUILDINGS, MANHATTAN, ON DECEMBER 31, 1911.

Year	Cases pending	In hands of Corporation Counsel
1905 . . . . .	1	1
1906 . . . . .	2	2
1907 . . . . .	5	4
1908 . . . . .	5	2
1909 . . . . .	13	10

Year	Cases pending	In hands of Corporation Counsel
1910 . . . . .	75	47
1911. . . . .	2,156	218
	<hr/>	<hr/>
	2,257	284
Cases filed since Oct. 19 . . . . .	287	...
	<hr/>	<hr/>
Cases pending . . . . .	1,970	284
	<hr/>	<hr/>

In the above statement the 287 cases filed after October 19th are deducted as the Corporation Counsel has advised that these were filed without authority of law and are invalid. Many of the 1,970 pending cases are now being complied with, but the work has not yet been completed so that the cases cannot be dismissed.

## NOTE V.

FIRE-ESCAPE ORDERS ISSUED BY THE BUREAU OF BUILDINGS,  
MANHATTAN, FROM JANUARY 1ST TO OCTOBER 19TH,  
1911, SHOWING THE CHARACTER OF OCCU-  
PANCY OF THE BUILDINGS.

Workshops . . . . .	1,746
Lofts . . . . .	423
Store and Office . . . . .	405
Store and Dwelling . . . . .	154
Store and Tenement . . . . .	6
Warehouse and Storage . . . . .	75
Stable and Garage . . . . .	107
Hotels . . . . .	250
Place of Assembly . . . . .	238
Schools . . . . .	81
Churches, Synagogues, Missions, Etc. . . . .	25
Nurseries . . . . .	28
Hospitals . . . . .	28

The expression "workshops" is used for such buildings as are entirely occupied either as factories or workshops. Lofts are such buildings which may be used for any commercial purpose, and many of the buildings here classified as lofts are used in part as workshops or factories.

## NOTE VI.

### COMPLAINTS RECEIVED BY BUREAU OF BUILDINGS.

Of 464 cases inspected by this Bureau for exit facilities during the first three months of 1911, attention was called to the same by complaints from several sources, as follows:

From the Department of Labor.....	68
From the Fire Department.....	60
From the Tenement House Department.....	7
From Individuals . . . . .	35
Discovered by Inspectors of this Bureau.....	294
	<hr/>
Total . . . . .	464
	<hr/> <hr/>

The above statement does not include the list of 14,000 buildings reported by the Fire Department in February, 1911. An analysis of this list is given in Note VII.

## NOTE VII.

### REPORT TO PRESIDENT McANENY ON CERTAIN COMPLAINTS MADE BY THE FIRE DEPARTMENT.

*August 18, 1911.*

HON. GEORGE McANENY, *President of the Borough of Manhattan:*

DEAR SIR:

You will recall that sometime toward the end of last year Mr. Waldo, then Fire Commissioner, made the statement that there were a very large number of buildings in the City of New York not properly equipped with fire-escapes.

Although he had no jurisdiction or responsibility in the matter, yet because of his statements in connection with it, you wrote him stating you would be glad to have his co-operation in investigating the question of inadequacy of exit facilities. He felt that having a large force at his command he could make inspections in a very short time and determine very quickly what was necessary in the way of additional exit facilities on buildings in the City of New York.

On February 8, 1911, I received from the Fire Department a list of a little over 13,600 buildings on which it was recommended that fire-escapes should be provided. In addition to this, other lists were later furnished, making altogether a list of 14,393 buildings on which fire-escapes were recommended.

As soon as I could arrange to do so, I organized a systematic inspection of all the buildings reported in the list. You will appreciate, of course, that this was a considerable burden on the inspection force of the Bureau, inasmuch as this Bureau is not charged with the duty of examining buildings after they are completed, but does this only on complaint. Fourteen thousand complaints coming in at one time of course was a very difficult task. The inspections have been made since February at the rate of about one hundred a day, which, when the other duties of the inspection force are taken into consideration, seems to me a very good showing. It must be remembered that the examinations made by the inspectors of this Bureau could not be the cursory examinations evidently made by the employees of the Fire Department. When an order is issued by this Bureau, a full description of the premises and an exact outline of the work required must be served upon the owners. This, you will readily see, involves considerable work, so that I feel that the work has been done very promptly. As far as I can judge from the list of buildings reported by the Fire Department, the extent of the examinations made by the firemen was to see whether a building was provided with outside fire-escapes, and if not simply to call for such.

Now that the work is completed, I should like to submit to you the following analysis of these complaints received from the Fire Department:

Total number of complaints received.....	14,393
Of these:	
Buildings not requiring fire-escapes under section 103 . . . . .	9,205
Buildings reported but already having sufficient means of egress.....	2,245
	<hr/>
Total buildings no cause for complaint.....	11,450
Buildings requiring better means of escape on which cases were filed.....	1,563
Buildings on which the necessary orders for fire-escapes were already pending.....	579
Buildings not within the jurisdiction of this bureau:	
Tenements . . . . .	626
Government building . . . . .	1
Dock Department . . . . .	1
	<hr/>
	628
Duplicate buildings reported.....	114
Miscellaneous conditions:	
Buildings in course of demolition.....	28
Buildings in course of erection.....	16
Buildings—no such numbers.....	10
Vacant lots . . . . .	5
	<hr/>
	59
	<hr/>
Total number of inspections made.....	14,393
	<hr/> <hr/>

Respectfully,

(Signed) RUDOLPH P. MILLER,

*Superintendent of Buildings.*

## NOTE VIII.

### CHARACTER OF ORDERS ISSUED BY THE BUREAU OF BUILDINGS FOR IMPROVING EXIT FACILITIES.

As illustrating the variety of the orders issued by this Bureau to improve exit facilities in buildings, the following memorandum



applying to the cases filed in the first three months of 1911 against factories alone, is submitted:

Provide fireproof stairways.....	8
Enclose stairways in fireproof walls.....	74
Enclose elevator shafts in fireproof construction.....	2
Provide fireproof passageways.....	8
Remove obstructions to exits.....	55
Provide self-closing fireproof doors.....	16
Extend fire-escape balconies.....	6
Replace vertical ladders by stairs.....	8
Provide exit signs .....	1
Provide outside stairs .....	1
Remove locks from doors.....	3
Remove wooden flooring from fire-escape balconies.....	2
Provide guard rails along stairs of fire-escapes.....	6
Cut exit openings in fences.....	1
Provide landing platforms at foot of fire-escapes.....	7
Cut doorways ... ..	2
Repair stairs ... ..	2
Provide proper exit.....	1
Make doors swing outward.....	22
Provide drop ladders.....	6
Enlarge windows to fire-escapes.....	2
Enlarge wellholes of fire-escapes.....	1
Provide iron bridge.....	1
Remove obstructions from fire-escapes.....	1

MEMORANDUM OF COMMITTEE OF NEW YORK  
CHAPTER OF AMERICAN INSTITUTE OF ARCHITECTS ON CONSTRUCTION OF FACTORY  
BUILDINGS AND THE FIRE PROBLEM.

*Comments on Questions Concerning Methods for Improving the  
Conditions under which Manufacturing is Carried on in the  
Cities of the First and Second Class of the State.*

NEW YORK, December 18, 1911.

In giving thought to the safety of buildings in which large numbers of workers are employed it would be a mistake not to consider the workers themselves. Many of them come from Southern Europe — taught by their fellows to believe that every man's hand is against them, and that most devices for their protection are schemes of the well-to-do for their undoing. Hysterical and distraught under unusual or seemingly dangerous conditions they are hard to control, and this makes it necessary that the methods of escape must be simple and direct and without any complications whatever that might require of them any intelligence or judgment.

The necessity for factories employing this class of help in this city is probably owing to the fact that the employers have no choice as to the location of their factories, for they must be where labor is available.

If we are to continue to allow manufacturing in high buildings, for the reasons given, the method of making them safe for this purpose must not be complicated or workable if this or that is done, or if this or that device happens to be in good order.

Should the laws be so restrictive in this matter as to drive the employers from the city, the loss would not be without compensation, for it would force these people into the outlying country where their condition in all respects would be better, and where their assimilation with our own people would be more rapid and prevent the always present menace to our community, politically, socially and morally, that obtains by reason of their living together with their own kind and a continuance of their old world beliefs, habits and prejudices.

A given number of American-bred workers would avail themselves of the means of safety provided without loss of life, whereas, an equal number of the class usually employed would not escape without great sacrifices, and this difference may be due wholly to a difference in temperament. When disastrous fires occur in fireproof buildings, it is believed by many that the fault lies with the construction. It is manifest to all that building construction of any type cannot prevent the burning of inflammable materials in such a building. It is also manifest that with a sufficient quantity of this inflammable material in a building the heat generated by its burning would destroy any structure, no matter what system of fireproof construction as yet devised might be used.

Ingenuity would seem to be exhausted in the devices and methods now in use for the making of buildings fireproof. But there still remains the inflammability of the goods housed therein as a menace to life and also to the fireproof structure itself. Our modern buildings are almost veritable crucibles, but we have apparently reached the limit in our endeavor to prevent their collapse under the application of the intense heat from burning merchandise.

We, therefore, are forced to consider the most positive means of sufficiently retarding or quenching a fire in the merchandise stored so as to enable the operatives to escape. The answer to this is the mandatory requirement of the application of a sprinkler system and the frequent inspection of the system by the proper municipal department.

By enforcing this requirement there is no injury done to the investor in this class of real estate, as the reduction of insurance premiums is so great on both the building and contents that they insure a very large interest return on the cost of this equipment.

Our laws require aisles for audience rooms. The law should also provide for aisles between the machines, and prohibit the obstruction of these aisles.

The law should limit the number of employees allowed for each loft, and the number allowed should be posted as is the number of pounds per square foot allowed as a live load. The privilege as to the number of employees should be flexible, as the manufactur-

ing engaged in requires more or less obstruction of the space with the materials used. All waste material should be removed at stated periods and not allowed to accumulate to create a fire menace.

The building laws prescribe the plan for theatres. The plan thus controlling provides open-air side courts as exits.

If in the interest of public safety this arbitrary provision of the law is not considered an unjust infringement upon the rights of property owners any like restriction in behalf of the safety of operatives in a loft building cannot be viewed otherwise than just and proper. In many loft buildings there are more people employed than can be accommodated in our theatres, and their situation is much more dangerous by reason of the greater height of the buildings.

Side courts as required for theatres, with open-air galleries accessible from the several lofts, these galleries leading to stairways entirely disconnected from the lofts, would provide the maximum of safety as exits.

The open-air side courts also help to answer the question of ventilation for the lofts, as they will insure the exposure of four sides of each loft to the open air. If the law should require the side courts to extend fully to the rear of the building and without obstruction connect with the open space usually reserved for light in the rear, it would allow the greater diffusion of smoke and not make the court galleries impracticable as exits, as might be if the courts were not continuous and thereby causing them to act as great flues.

It may be argued that this requirement would so reduce the usable space on the floors on a given area of lot as to make the rental for manufacturing purposes impossible. While I do not think this is true, it cannot be denied that if the result would be the driving of the workers from the crowded tenements to the outlying country where the factories in which they are employed could have the light and air assured by the modern construction now standard it would be of the greatest value to the workers and the community at large.

No reasonable sacrifice of available area of the property must stand in the way of the perfect safety of the plans of new buildings as to stairways, side courts and exits.

We unhesitatingly demand of property owners a proper allowance of their land for light and air for our habitations to conserve the health of our people. We may, with equal justice, demand that factory buildings shall be built with due consideration for the lives of the workers employed therein. It remains only to adopt the most feasible plan of their arrangement to insure time for a safe exit, and for the smothering of fire in the merchandise.

This subject so far as it relates to buildings already constructed has added difficulties. It would seem necessary almost to consider each building separately, for the conditions vary with each one. An official certificate of occupancy stating the conditions under which the building may be used is, perhaps, a method by which the least hardship and injustice may be imposed upon the owner, not forgetting that he invested his money in a manner then approved by the law, and is innocent of any intentional wrong.

By the thoughtless or envious it is too frequently supposed that property in any form represents luxury and idleness, whereas, it represents in the larger proportion of the real estate the savings of the industrious worker, either still striving or gone to his fathers, leaving only a modest independence for those deprived of the benefits of his active labor, with constantly increasing taxation and with restrictive laws, in many cases where the equities are small the result of mandatory laws compelling reconstruction will mean confiscation.

Certificates of occupancy should, of course, vary as to the privileges granted under them in conformity with the area of the building — its height — facility of escape in cases of fire. These variations will range from absolute prohibition of its use for manufacturing to the maximum number of employees allowed for the area of its floors.

Owners may then add at their option such safety of construction as seems wise to them for the purpose of securing a more favorable certificate of occupancy, and thereby increasing the returns from their property. This same method is now employed in fixing rates for fire insurance. It is also applied in regulating the live loads which may be safely carried by the floor construction of buildings. It would seem that this system of regulation would be less objectionable than the arbitrary enforcement of any particular re-

quirements for all buildings, as it would allow each building to stand on its own merits of area, height, construction, location and juxtaposition with others of varying dangerous character.

Doors to fire-tower enclosures opening directly from the lofts should be prohibited, for the reason that these doors when opened as a means of escape from a burning loft fill the stairway enclosure with smoke and make it impossible of use for the occupants of all other lofts above the one burning. For this reason there should be exits from all lofts directly to the open-air balconies and from these to the fireproof stairway enclosure.

There seems to be, however, no scheme of construction or arrangement of stairs and exits that will safely provide against the contingency of fainting, helpless women, whose falling blocks the ways of egress.

Differentiating between the safety of occupants in our high office buildings and apartment houses, and those used for manufacturing purposes we know that in offices and apartments there is not enough inflammable material to affect the structure if this material should burn out without interference, whereas, the conditions in a loft building are usually the reverse. We are too willing to believe that since the modern high structures are practicable for certain uses they are for all.

The number and width of stairways and final exits are necessarily limited, and this limit should establish the number of people to be safely employed in one building.

The speed of movement through a given width of passage and stairway can be determined by experiment and should control the number of people who must escape by use of such passage or stairway. By such experiment it would seem that the height of buildings for manufacturing purposes could be determined.

It must also be remembered that physical endurance places a limit on the number of flights of stairs that a person of average physical condition can descend even under circumstances of great necessity. Their failure to proceed when their endurance gives out will cause an unusual congestion on the staircases, and defeat what might otherwise appear to be a safe condition.

If we must have factories in high buildings, perhaps the ideal plan for the occupation of a city block would be that of allowing the full occupation of the lot by the cellars and ground floors, with the present system of offsets in the rear wall of the upper stories providing for light and air. Adding to this, open-air side courts connected with the space in the rear; so constructing the roofs over the rears of the ground floors to give light for the stores below and form a continuous thoroughfare through the block for escape in case of fire in any of the several buildings. Should stairways also be necessary in the rear as well as the front they could be entirely separated from the lofts and lead down to and connect with the thoroughfare in the rear of the buildings.

As a protection to property owners any law controlling these matters should provide for an appeal from the decision of any bureau having in charge the execution of the law, so that the merits of each case could have more thorough consideration than is possible to be given by the chief of such bureau, and thus avoid unreasonable expense being forced upon the owner by reason of his case being decided under the general provisions of the law rather than on the conditions existing in each particular case. It may frequently occur that safer conditions could be provided than those stipulated by the code and with less embarrassment to the owner of the property. If appeal could be made to a board of arbitrators composed of professional men, disinterested and so technically trained as to be familiar with the subject, the injustice of arbitrary requirements would be less frequent and burdensome on the property that now practically bears the entire expense of the administration of the municipality.

#### ANSWERS TO SPECIFIC QUESTIONS:\*

##### *Question 65:*

Smoking in lofts where inflammable goods are being manufactured should be prohibited, and the occupant required to post notices to this effect; but for this offense to be made a crime, by law, seems an unnecessary addition to the already rapidly increasing number of restrictions of our personal liberties. It may be safely left to the employer as a matter of discipline in his establishment.

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\* See Questionnaire, p. 588.

*Question 66:*

Wooden partitions should not be allowed in any buildings classed as fireproof; and in buildings not so classed as fireproof, the partitions should be constructed of any of the several types of non-inflammable material.

*Question 67-A:*

The automatic sprinkler system is probably the only effective method of retarding or smothering a fire in merchandise. The use of gases is not practicable on account of their effect upon the occupants.

*Question 67-B:*

Exits from lofts and those to fire-escapes should be made conspicuous either by lights or the color used in painting such exits.

*Question 67-C:*

All doors and sash forming exits from lofts and those to fire-escapes should be made of metal.

*Question 67-D:*

Windows leading to fire-escapes should not be glazed with wire glass unless the sashes are hinged and open outward, otherwise should the opening mechanism get out of order, escape would be made with great difficulty, and perhaps impossible.

*Question 68:*

Owners or occupants should be allowed to make minor changes in the arrangement of their premises without the necessity of filing complete plans of the whole building; but the owner or occupant should not be allowed to make such minor changes without the consent of the department in control of matters of this kind.



*Questions 69, 70, 71, 72:*

For buildings of questionable safety fire drill would undoubtedly improve conditions and should be mandatory, except for buildings having adequate provision for safety. A mandatory law, applying to all buildings, would work injustice to the owners or occupants who have otherwise met the maximum requirements. The system of fire drill adopted by the public schools of the city of New York could be adopted to factory building conditions, and should be co-operative to reach its highest efficiency.

*Questions 73, 74, 74-A, 74-B, 74-C:*

Conditions vary so greatly by reason of the difference in condition, size and location of buildings and their uses, that it would be inadvisable to compel all owners or occupants to install an automatic sprinkler system, but it should be within the power of the department in charge of public safety to require such installation when after investigation of the conditions it may prove necessary to safeguard life by this means. The construction of the buildings, its height, number and character of its exits, number of persons employed therein and the merchandise manufactured therein should be considered in arriving at a decision as to the necessity of installing a sprinkler system, for all buildings and their uses should stand on their own individual merits.

*Questions 75, 76, 77:*

All buildings occupied by the maximum number of employees allowed under their class rating, and especially those in which the manufacture of textile goods is carried on, should be equipped with an auxiliary fire-alarm system; as this system may be connected with and be a part of the automatic sprinkler system, it would seem that it would adapt itself to a building occupied by any number of independent establishments. Connection with fire headquarters should be required for buildings in the more congested districts.

*Question 78:*

It does not seem necessary to limit the height of a building in which manufacturing may be carried on. It would rather seem

necessary to limit the number of operatives employed in a building of any height. Thus, four lofts devoted to manufacturing in a building twenty stories high would present less difficult means of escape than ten lofts used for manufacturing in a twelve-story building, for the reason that in the latter case there are more people to cause congestion on the stairways of any practicable width.

*Question 79:*

There should be penalties for the disobedience of rules laid down for the safety of operatives in buildings, but these penalties should be exacted from the individual who commits the act. It is too frequently the case now that the law acts against an innocent and even absent owner of property or an employer of labor on the theory that he is responsible for the acts of his agents or employees. Doors in manufacturing buildings should not be locked and if those in immediate charge of them knew that they themselves would suffer personally for any breach of this rule, the regulation would be less frequently disobeyed. Notice of this regulation and the penalty for its breach should be posted on all doorways and exits.

*Question 80:*

As all machinery differs in accordance with character of the manufactured article, it may be advisable to require the submission of a plan of the machinery to such department as may be delegated to supervise matters of this kind. Each case would develop its own necessities as to the allowance for width of aisles and the number of people allowed for the space used.

*Question 81:*

Doors or shutters should not be allowed to open inwardly at any exit or fire-escape under any circumstances whatever.

*Questions 82, 83:*

It would be preferable and facilitate rapid exit and prevent possible congestion if window sills were prohibited at openings

leading to fire-escapes. In factory buildings fire-escapes should be placed at the floor levels and the openings should be fitted with doors opening outward, rather than with lifting sash. These doors need not obstruct the fire-escapes, for the doors could be made double and the jambs to the openings deepened to receive the two sections of the doors.

*Question 84:*

The standard of construction for fire-escapes required under the Tenement House Law should be used only as a minimum of requirement for factory buildings. Fire-escapes for factory buildings should be of such construction and form as will meet the needs of the particular building to which they are to be applied.

*Question 85:*

The lowest balcony of fire-escapes should be provided with counter-balanced ladders rather than those that have to be unhooked and placed in position. The counter-balanced type cannot be displaced, while those of the other type can be, and frequently are removed from their proper position and used for other purposes.

*Questions 86, 87:*

The number of people permitted to work in a factory building should be determined upon the number and kind of exits provided, and also upon the other conditions existing in the building. Each building should be considered separately by some responsible authority, and no general specific requirement for all existing buildings should be applied irrespective of their individual conditions.

*Question 88:*

There should be posted in all lofts used for manufacturing purposes a placard stating the maximum number of people permitted to work in such loft.

*Question 89:*

Factories and loft buildings should be licensed for certain designated occupants, and changes in the nature of the occupancy should be prohibited, unless expressly authorized by the responsible authority.

*Question 90:*

The requirement that stairways that wind around elevators must be removed in existing buildings would work great hardship on the present owners. It would seem better to penalize such buildings as to the number of employees allowed therein.

*Question 91:*

The requirement that existing elevator shafts be enclosed in fireproof walls should not be general; but apply only where the condition is a menace to life.

*Question 92:*

The requirement that existing stairways be enclosed in fireproof walls should not be general; but apply only where the condition is a menace to life. This condition can be properly regulated by penalizing the building as to the number of operatives allowed therein.

*Question 93:*

Fire walls should not be ordered installed in existing buildings, as each existing building should stand on its own merits, leaving it to the owner's option as to whether he will install fire walls recommended, or suffer the penalties through securing a less desirable certificate of occupancy.

*Question 94:*

Fire towers should not be ordered in existing buildings as each existing building should stand on its own merits, leaving it to the owner's option as to whether he will install fire towers rec-

ommended, or suffer the penalties through securing a less desirable certificate of occupancy.

This Committee deems it advisable to make as few specific recommendations covering points of construction as is consistent with replying to the questions asked by the Commission. Such recommendations will more properly come from the Joint Committee on City Departments of the New York Chapter, the Building Trades Employers' Association and the Board of Fire Underwriters, which associations are engaged in a close and careful study of the entire subject of the Building Code.

This Committee recommends that if abutting owners mutually agree to connect their premises to aid escape by balconies, stairs, or bridges located at effective points, that these conditions shall accrue to their advantage by relieving them of other mandatory requirements as to reconstruction of their premises.

## THE NECESSITY FOR A STATE BUILDING CODE.

By ROBERT D. KOHN, Esq., *Architect, New York City.*

*To the Factory Investigating Commission:*

GENTLEMEN:

I am very glad to present to your Commission, very briefly, the outlines of a plan which in my opinion will help greatly to reduce the fire hazard risk in this State, both with regard to life and property. Although I am secretary of what is known as the Joint Committee on City Departments, which is composed of representatives of the New York Chapter of the American Institute of Architects, the Building Trades Employers' Association, the American Institute of Consulting Engineers, the Brooklyn Chapter of the American Institute of Architects and the Board of Fire Underwriters, and am also a member of the Executive Committee of the National Fire Protection Association, I appear before you without any official commitment from those organizations, but the opinions I express are those I have formed as a result of my experience in these various organizations, and in my own practice as architect of large manufacturing plants in this city and various parts of the country.

I shall mainly confine myself to one point—the need of a State Building Code. It seems to me in the first place that there should be in each State a basic code which shall lay down certain definite minimum rules for the construction of *all* classes of buildings within the area of the State. This should in no way prevent the adoption by individual communities, townships, villages or cities of detailed building codes suitable for the needs of each individual case. Indeed, it would be unfortunate in any way to restrict the power of a city like New York to pass its own building code. The methods of construction are so constantly changing, and the materials of fireproof construction increasing so greatly in number, that a detailed State code would be too inelastic to properly meet the needs of building, which is a constantly developing art. What I wish to urge is a code which shall merely outline certain minimum requirements with regard to the protection of life and property against the fire hazard.

Under the present method, one way of building is approved in 262nd street, Borough of the Bronx, and an entirely different method 100 feet north of the same street, because that is within the city limits of Yonkers. This condition is even more noticeable when it comes to the outlying districts of the Borough of Queens and in the surroundings of the larger cities of the northern part of the State. It is possible, in my opinion, to build the most dangerous sorts of factory building in rural communities. The danger from great conflagrations in some of our villages and smaller cities is great. There are many having a population of twenty or thirty thousand, where there is no building code, or where the building rules are absurd. Large areas are covered by wooden frame buildings without the slightest protection on the most simple lines against the spread of fire. Every member of this Commission is familiar with villages where one frame store is built next to another without any dividing fire walls. The great fire in Chelsea, Massachusetts, was a vivid example of what a fire will do in such an overgrown wooden village. This State is full of factory buildings, built many years ago to be sure, of frame, where hundreds of people assemble for manufacturing purposes. Just because they were outside of any city limits they were unrestricted in their forms of construction. The fire hazard is not only great in high factory buildings in big cities — it is enormous in low buildings of large area. The Newark fire was an indication of what a fire will do in a three or four story building. Our State factory legislation attempts to get at the evil in the factory, but it only touches the evil in that one class of buildings.

Such a State Code as I have in mind would prescribe, as I have said, certain simple requirements so as to leave to the community or the individual builder the greatest possible latitude in the use of materials or means of building to accomplish the ends desired. It would prohibit, for one thing, the use of inflammable roofs on any building built within the State where any part of the building comes within (let us say) 50 feet of an adjoining structure on any side. Such a restriction would not prevent the use of shingle roofs in the open country or in villages where houses are widely separated, but it would prevent the construction of a continuous row of inflammable buildings with inflammable roofs.

A State Building Code would probably require where non-fireproofing buildings were built in rows, that the intervening walls should be built of brick or other fireproof materials at least twelve inches thick, with parapet walls, and so constructed as to prevent the spread of flames across the roofs. Such a building code might well require that factories more than one story in height having an occupancy greater than 50 people should be built with walls of fireproof material; it should provide that every elevator shaft in any building shall be enclosed by brick or other fireproof walls, and that every staircase in such buildings where more than 50 people are accommodated on any floor shall be similarly enclosed. A State Building Code should provide that every room or space that is to accommodate more than 50 workers or people assembled for any purpose, shall be provided with at least *two* means of exit from that space or room; that in every manufacturing building more than one story high not more than 100 persons shall be accommodated on any floor unless that floor is subdivided by a fire wall or fire partition, so that within the areas of such fire walls or fire partitions not more than 100 persons are accommodated at one time; that every such building subdivided by intervening fire walls or fire partitions, shall have at least *two* means of exit from every one of its subdivided spaces (probably no better life protection device has ever been suggested than the dividing fire wall or fire partition). In every factory building more than three stories in height, such a code ought to require that at least one of the means of exit from every space in which 100 people are assembled shall be provided in the form of a fire tower, or what has been recently familiarly called the "Philadelphia Type of Fire Staircase." In such a code it might be safe to allow of the assemblage of a larger number of persons, for instance, in any one area confined within fire walls or fire partitions where the building is of fireproof construction, with automatic sprinklers. In our New York city Building Code, we require that every floor in every factory or loft building shall have posted on its walls the safe load, the number of pounds per square foot that the floor will safely sustain. In my opinion it is just as important that every floor of every building have clearly posted on it the number of persons that may safely work in that par-



ticular area of floor, and the number of persons for which such floor or space may be posted, ought to be definitely restricted according to the number of exits and the facility for exit provided for that space. The basic principle for such calculation could easily be worked out — indeed, it has practically been worked out, and the data would undoubtedly be available at short notice should your committee desire to have it.

Not least important should be a requirement that in no existing building in this State shall a greater number of persons be assembled for any purpose whatsoever than can safely be accommodated by the exits; the permissible occupancy being rated according to the rules previously referred to. This would get at the evil of existing fire traps. Their use would be restricted, their permissible occupancy reduced unless dividing fire walls or fire partitions were built and two means of exit provided for each subdivision of the area. An unenclosed staircase would no longer be considered an exit, and an unenclosed elevator shaft would be absolutely prohibitive in its restrictive effect upon the use of the building by larger numbers of people.

In outlining these few points I have not attempted to develop, but merely to hint at what a State Building Code should be, and to indicate some of the effects that might result from such a code. A code such as I favor should certainly fix for all structures in the State the maximum safe loads that may be put upon wood, steel and stone. Such a basic code should be prepared by a commission of experts only — engineers, architects, fire protection experts and experienced builders. Pennsylvania has recently appointed a commission to draft such a code. The Legislature of the State of Ohio, about six months ago, adopted a State Building Code, though, I believe, it was one that was very elaborate, filled with details of methods of building construction. It is not my opinion that this would be a wise plan for the State of New York. I should rather see a very simple State Code; one that would not enter into the means of construction but (as I have said before) outline the means of protection to be afforded life, health and property, and then leave it to each individual community to develop its detailed code according to its own needs.

COMMENTS ON THE SCOPE AND PROVISIONS OF  
THE SULLIVAN-HOEY FIRE PREVENTION LAW.

*By* WALTER LINDNER, Esq., *of the New York Bar:*

NEW YORK, *December 21, 1911.*

MR. ABRAM I. ELKUS, *Counsel, Factory Investigation Commission, 165 Broadway, New York city:*

DEAR SIR:

You have asked for a statement of my views concerning the Sullivan-Hoey Fire Prevention Law (Chapter 899, Laws of 1911).

By the new sections, 774 and 775 of the Charter enacted by this law, the duties and powers of the Commissioner do not apply to tenement houses. It seems to me that this exclusion should be carefully considered. May not the result of this exclusion be that there will be fire hazards and perils in houses over which the Tenement House Commissioner has jurisdiction, which are the result of violations of law or ordinance but are not prohibited by the Tenement House Law? Is it intended that neither the Tenement House Commissioner nor the Fire Commissioner shall have power to require the remedying of such conditions? It is conceivable that a building classified as tenement house may be used partly for manufacturing and thus require the application of standards with relation to exits and other fire-prevention equipment which are not known to the tenement house law, and which the Fire Commissioner would not be called upon to require.

The procedure under the act is faulty. While orders of the Fire Department may be addressed to owners, lessees or occupants, the attempt to create a lien will fall on the owner, although it may be the lessee or occupant who was bound to perform the work required by the Department or who received the notice. The owner may be entirely innocent and ignorant of the requirements of the department, but the expense of complying with the orders of the Department is made a lien on the rent and compensation due to him.

Section 776 declares that buildings which are perilous to life or property, in case of fire therein, are declared to be nuisances, and the Fire Commissioner is empowered and directed to cause such nuisance to be abated. It is not clear how this is to be done. Shall it be done by action in equity, or under summary proceeding under section 778? Apparently the summary proceeding applies only in those cases where orders have not been complied with, or the Commissioner certifies that an emergency exists. But a mere perilous condition, not amounting to an emergency and not contrary to a law or ordinance which would be the proper subject of an order under section 775, would not come under the provisions of section 778 and therefore could not be abated except as a nuisance, which means an action in equity subject to all the uncertainties of remedy and requirements for action of the equitable remedy upon the person, and not in any way proceeding in rem.

The proceedings under the bill for a survey, so-called, are not fair or scientific. The idea of a survey was first suggested in this connection in the draft of a bill prepared by a sub-committee of the Committee on Legislation of the Citizens' Union, and was embodied in a tentative draft of a part of the bill which was afterwards the McManus-Herrick bill, from which the idea was embodied into the first forms of the Sullivan-Hoey bill.

The provisions for survey, as enacted in the law under consideration, differ materially from the ideas upon which a fair and effective procedure for survey should be founded. In order that the procedure under a survey should be effective, the Fire Department must be able to require the owner either to comply with its orders or justify his refusal before a Board of Survey, subject to supervision of their action by the Supreme Court. The procedure which is called a survey in this law, in no sense resembles the notion of an independent, impartial investigation by a Board of Survey. The surveyors are not selected as impartial persons, but are all selected by the Commissioner. The fact that one of them may be a person named by the Board of Fire Underwriters does not make it likely that he will be impartial, but merely that he will seek to establish such standards as will dimin-

ish the hazard to property, this being most likely to be the view of the Fire Underwriters.

The court review is not a proper court review of such a procedure. It is to be obtained by certiorari, the object of which is to inquire into the regularity of the proceedings of the board, and not to try the issue whether the premises comply with law and are safe. The procedure under the McManus-Herrick bill differed from this materially. Under this bill, the Department could force the owner before the Board of Survey which was composed in the first instance of two persons, one named by the Department and one by the owner, who if they did not agree, selected a third, impartial person. There was appeal to the court and trial of the issue whether the premises complied with law and ordinance as an original proposition. The result of this was that the Department would be equipped with an efficient and summary remedy by which conditions which it thought improper could be investigated summarily, and if found to be wrong, judgment for correction would follow quickly with efficient remedy in rem against the property.

The procedure under the Sullivan-Hoey bill is ineffectual. The question whether the owner shall go before the Board of Survey appointed by the Commissioner is at the option of the owner. If he does go before the Board, he deprives himself of his legal remedies to combat the orders of the Commissioner by injunction or otherwise. The owner who would put his head into the lion's mouth this way would be very foolish. It follows, therefore, that no one, well advised, who seriously questions the orders of the Department, when to carry them out would be expensive, will go before the Board of Survey, but will seek to enjoin the action of the Department or take some other remedy outside of this act. The result will be that the procedure for survey under the act will seldom or never be employed in important cases and probably not in any case. In this connection, it must be noted that the order of the court on the certiorari is not reviewable on appeal.

Section 776-A seeks to provide for reimbursement to the city of the expenses of carrying out orders of the Commissioner when the owner refuses or neglects to do so. These expenses are

made a joint and several charge against the owners, lessees and occupants of the building. This is irrespective of who among them is responsible for the unlawful condition or chargeable with the expense of repairs or changes, and the expenses are declared to be a lien on rent and compensation due, or to grow due for the use of the building to which the order relates and in respect of which the expenses were incurred. There is no provision when this lien arises. Does it arise when the work is commenced, when the work is finished, when there is a notation thereof in the Department? There is no place provided where the lien shall be noted so it can be found upon searches, nor is there any provision for determining the amount or questioning the reasonableness of the charges.

Another important defect of this law is the lack of publicity under it. It is not provided that there shall be kept any record of inspections made under the law, notices issued or claims for liens on the part of the city. In no place can dependable searches be made or information obtained as to procedure of the Commissioner against specific property under this law. In fact, in an attempt to devise some method by which searches could be made, when necessary in real estate transactions, the Fire Commissioner has taken the position that the records of the Fire Prevention Bureau are not public documents, that much of their contents are of a confidential nature, and that no general access to these records can be allowed. It should hardly be necessary to point out the danger to owners and persons attempting to deal in or make loans upon real estate, of a situation where important claims may be noted against premises and cancelled and replaced upon the premises at the will of officials, without public knowledge or ability of the public to gain access to the record and find out when or how notices of violation, claims against and liens upon the property were put on, cancelled and replaced. The temptation to do these acts in favor of, or to the detriment of individuals, when the records are not public is too great to be put into the power of clerks and subordinates of the bureau. If the records are public, it will be shown when, where and how notices of violation, claims and liens are put upon property and how they are disposed of,

and the acts of the Department will be subject to such scrutiny that favoritism or spite will be very much diminished and, in fact, made extremely difficult. With regard to the lien in favor of the city, there is no provision how it may be cancelled if it be satisfied.

It seems to me that this bill should be amended so that the Fire Commissioner has efficient powers to enforce his orders. To do so, he should be able to force the owner to take the survey, but the survey should be a fair and impartial one, the owner and the Department having equal opportunity to name the initial members of the Board, and if they cannot agree, they can name an impartial third person. The surveyors should be sworn to make an impartial survey. Their report should be placed before the court and the issue raised by their report should be tried summarily without a jury. The directions found necessary as the result of such a trial should be required to be carried out by the owner or the Department, and if the Department does the work, it should be able to make a return of its expenses at the foot of the order which reviews the survey, and obtain a judgment for those expenses, subject to taxation of their reasonableness by the court.

The entire procedure as soon as initiated in the courts should be the subject of public notice by filing notice in the nature of a *lis pendens* in the County Clerk's office, with direction properly to index the same, and there should be provision that when the city has been reimbursed for its expenses, some official have power to discharge the city's lien. Naturally, the amount of the expense adjudged in favor of the city should be a lien in rem against the property and personally against the owner or person of whom it is adjudged, that he is in fault for not complying with the orders of the Department.

The records of the Department in which are noted violations, orders for inspection, results of inspections, orders issued and all matters as between the Department and real estate owners and occupants, should be matter of public record so that owners and persons dealing or intending to deal with property can be informed of the record of the property. It is absurd to say that if property be a fire hazard that is a matter of confidence between the Depart-

ment and the owner. If a fire hazard exists, it is not a matter of confidence, but is a matter of public concern and the condition should be righted and not allowed to be the subject of confidential negotiation between the subordinates of the Commissioner and the owner.

In expressing the foregoing views, I speak for myself only, and because I have been requested to state them for the benefit of your Commission.

Very truly yours,

WALTER LINDNER.

## STATE FIRE MARSHAL'S DUTIES.

STATE OF NEW YORK, DEPARTMENT OF STATE FIRE MARSHAL,  
ALBANY.

TO THE FACTORY INVESTIGATING COMMISSION, AUTHORIZED BY  
CHAPTER 561 OF THE LAWS OF 1911

HON. ROBERT F. WAGNER, *Chairman*:

SIR:

In accordance with the letter of Abram I. Elkus, Esq., Chief Counsel, under date of November 4th, I have already furnished copies of the State Marshal Fire Act, and in addition submit herewith statement of the operations of my office.

*Duties of the State Fire Marshal:*

The State Fire Marshal has two principal lines of duty.

- (a.) Enforcement of all laws and ordinances of the State, and the several counties, cities and political subdivisions thereof, except New York city.
- (b.) Inspection of places upon complaint of any person, or upon his own initiative.

*Enforcement of Laws and Ordinances:*

The State Fire Marshal Law enumerates the laws and ordinances which are to be enforced by that office as follows:

- I. The installation and maintenance of automatic or other fire alarm systems and fire extinguishing equipment.
- II. The inspection of steam boilers.
- III. The construction, maintenance and regulation of fire-escapes.



- IV. The means and adequacy of exit, in case of fire, from factories, asylums, hospitals, churches, schools, halls, theatres, amphitheatres, and all other places in which numbers of persons work, live or congregate from time to time, for any purpose.
- VI. The suppression of arson and investigation of the cause, origin and circumstances of fires.

*Inspection:*

The State Fire Marshal is required to inspect buildings on receipt of complaints, or when he deems it necessary, and to take action if the building is dangerous on account of want of repairs, absence of fire-escapes, or fire appliances, age, dilapidated condition, presence of combustibles, or other causes of fire.

*Organization of State Fire Marshal's Office:*

The State Fire Marshal Act took effect on September first, of this year, so there has been less than three months in which to carry on the work. It must be recognized that considerable time is required to get an investigation office such as the State Fire Marshal's into effective working shape. The natural delays consequent upon a new undertaking have been increased by the receipt of numerous complaints, which appear to demand immediate attention, and, to some extent, interfered with systematic work.

The State Fire Marshal has appointed the staff provided by law, and in addition eight inspectors, and with this force is actively at work securing such improvements as are possible under the circumstances. An outline of the activities already started may be given as follows:

- (a.) Investigation of causes of fire by local officials, with reports on forms furnished by State Fire Marshal, and special investigation by Deputy State Fire Marshals, if there are evidences of arson.
- (b.) Inspection and reports on the fire condition of State buildings by Deputy State Fire Marshals.

- (c.) Inspection of local fire departments and active co-operation with the department heads for the improvement of their methods and equipment.
- (d.) City and town inspections by State Fire Marshal staff.
- (e.) Inspection of individual buildings on receipt of complaints.
- (f.) Systematic examination of boilers by local officials with reports to the State Fire Marshal as to their inspection or lack of inspection.
- (g.) Compilation of a code of regulations covering combustibles and explosives.
- (h.) Investigation of the water supply available for fire purposes in the smaller towns and cities.

The carrying of all the work outlined is considered only preliminary to a systematic campaign to make New York State foremost in fire prevention. The State Fire Marshal is aware of what has been done in Ohio, Nebraska, West Virginia and other States, by the respective State Fire Marshals. He is also aware of the great progress in fire prevention as practiced by private corporations. Fire prevention indeed is so technical and highly developed that the State Fire Marshal deems it necessary to secure experts in organizing his office and planning work required by law, and he is making arrangements to secure the services of the best qualified men for this purpose. It must be recognized that in the conduct of a public office such as the State Fire Marshal's, it is necessary to secure experts who are not only competent in fire prevention as applied by insurance and other private organizations, but who are also thoroughly familiar with public departments and understand the practical difficulties presented in administering laws and ordinances.

A detailed plan of operations will be worked out by the experts retained by the State Fire Marshal, and thereby give assurance that the work will be performed according to established fire prevention principles and practices.

*Fire Prevention Measures:*

Fire prevention covers so wide a field, and embraces so many appliances, systems, devices and constructions, that the State Fire marshal can do no more than propose to apply fire prevention as the conditions of the individual buildings demand.

It is recognized, for example, that fireproof construction is advisable, and perhaps necessary, in certain classes of buildings. Also, that the reconstruction or alteration of existing buildings of a non-fireproof character may have to be compulsory.

It is also recognized that fire alarm systems both of the automatic type and the manual type, and those designed for use of watchmen, will be necessary, and in many cases the compulsory installation of complete automatic sprinkler systems, including automatic electric supervision, will have to be insisted upon.

The provision of means of escape which are not only adequate but reasonably safe is a fundamental requirement, and wherever there are assembled a large number of persons, particularly in work shops and factories, a fire drill or organized method of leaving the building will have to be arranged. The various conditions presented will be special problems and require appropriate fire prevention treatment.

*Condition in Factories:*

The receipt of numerous complaints by the State Fire Marshal, and the inspections already made by his staff, indicate that the lack of fire prevention is pronounced in the factories outside of New York city, and is probably worse than in the metropolis.

Many of the smaller towns and cities are without city ordinances, and, in addition, the methods of inspection and the number of inspectors provided are not equal to those in the city. Sufficient time, however, has not been allowed the State Fire Marshal in which to make a proper study of fire conditions in his territory, nor to form a fair comparison with conditions existing in New York.

Respectfully,

THOMAS. A. AHEARN.

(2.) **FACTORY INSPECTION, ACCIDENT PREVENTION AND  
SANITATION.**

**FACTORY INSPECTION.**

PROF. HENRY R. SEAGER, *President of the American Association  
for Labor Legislation.*

The most important question that confronts your Commission is, obviously, that of determining the most effective form of organization of the factory inspection service for a state like New York. There is, doubtless, much to be said in favor of a separate department of factory inspection for New York city. The census of 1910 showed that more than half of the population of the State is now found in this city. Moreover, from 1900 to 1910 the population of the city increased by 39 per cent, while the population of the State outside of the city increased by only 13 per cent. Should these relative rates of growth continue, there will be nearly 7,000,000 people living in New York city by 1920 and less than 5,000,000 in the State outside of the city, and by 1930 the population of the city will be nearly 10,000,000, while the population of the State outside of the city will be barely 6,000,000. It is thus clear that New York city has attained such a dominant place in the State as to be entitled to a separate department of labor, if this would promote more efficient administration. This view is reenforced by the consideration that there are concentrated in this city more people than are found in any of the states of the Union, except New York itself, Pennsylvania, Illinois and Ohio.

The real question, however, is not whether New York city is entitled to a separate department, but whether this would yield better results. After careful consideration of the matter, my opinion is that it would not. The labor law is, and will continue to be, the result of State legislation. In connection with its administration uniformity is all important. This can best be secured by making the authority responsible for enforcement of the law co-extensive with the authority enacting the law. On these grounds, I believe that the present organization of the State Department of Labor, to enforce the labor law throughout the whole

State, should be continued. As time goes on, it is clear that New York city is going to be the dominant factor in State politics and, therefore, any neglect of the interests of the city which may have occurred in the past is less and less likely to occur in the future.

At the same time that I favor preservation of the present single Department of Labor for the whole State, I believe that fuller recognition should be given by the Commissioner of Labor to the fact that labor conditions in New York city deserve to receive the major portion of his attention, since the majority of the wage-earners of the State are found in the city. It would probably be unwise to transfer the head office of the Department from the State capitol, but the office in New York city ought to be considered the principal office from the point of view of the enforcement of the law. The Chief Factory Inspector and the Superintendent of Safety ought to make the city their headquarters (as I believe they now do), and complaints ought to be brought to the attention of violators of the law in New York city directly from the branch office in New York, without the necessity of an appeal to Albany.

On the second question, that is, as to the relative merits of a Commission versus a Commissioner to be responsible for the enforcement of the labor law, my view is also favorable to the present system. A Commission of three may be highly efficient when the three commissioners work together, but there is always the danger that their views may not be harmonious and then such a body becomes quite inefficient. I believe the experience of New York State favors the single commissioner system of administration. Given the right man at the head of the department, which means adequate compensation and adequate recognition on the part of the people of the State of the dignity and importance of the office, I believe he can be depended upon to surround himself with subordinates who will meet the various requirements of the situation as well as a larger group of three commissioners. The example that is commonly cited in favor of the commission system is that of Wisconsin, but there are two reasons why the experience of Wisconsin should not serve as a precedent for this State. First, the three commissioners who are enforcing the Wisconsin law are men representing the same point of view with reference to the law

and able to work in cordial cooperation. Second, the Wisconsin Commission has much wider powers than the New York Commissioner of Labor, being responsible not only for the enforcement of the labor law, but for the administration of the workmen's compensation law and the operation of free public employment offices. Furthermore, the Wisconsin plan is still on trial, and it would be premature to conclude from the efficient work of the present Commission, that this system is superior to our system in New York.

In reference to the number of factory inspectors, my opinion — based on some study of the operation of the law — is that what we now need is not so much more inspectors than the 80 now authorized by the law, as inspectors of higher quality. The work done by the inspectors is vital to the whole system of factory regulation. The position ought to be made as honorable and permanent as is the case in the United Kingdom. This means appointment and promotion strictly on the basis of merit, larger compensation, and retirement on a pension when a certain age has been attained after a certain number of years of service. As regards these points, the organization of the Department of Labor in New York is no worse than that of other departments, but the lack of the best ability among factory inspectors is a worse evil for the people of the State than the lack of such ability in other departments which touch their interests less vitally. I think a recommendation on the part of your Commission for a commission to examine into the whole civil service system of the State, with a view to its reform, would be very much in order.

The other important general problem with which you have to deal is as to the detailed safety and sanitary standards which should be prescribed in the labor law. As to this question, I am convinced that the plan adopted by Wisconsin of laying down general requirements as to the safety and sanitation in the law and leaving it to the Industrial Commission (with us the Commissioner of Labor) to issue detailed regulations applicable to different industries to hold them up to these general requirements, is to be preferred. Under the complex and variable conditions of modern industry, it is impossible to specify in the law the regulations with which employers should comply in the management of their factories. The more flexible system of administrative regu-

lations, subject to change as conditions change, is the only practicable method. The objection to this plan is, of course, that it gives too great power to the Commissioner of Labor and that this power may be abused either because the commissioner is autocratic or because he or his subordinates are corrupt and make their authority a source of graft. The Wisconsin plan to avoid these dangers is to have three commissioners, rather than one, and to make their regulations subject to review by the district court sitting at Madison, to determine their reasonableness. I believe we should adopt a somewhat different plan, suggested by the policy of Massachusetts with reference to its Board of Boiler Rules, created to prevent accidents through boiler explosions. This is to have behind the Commissioner of Labor a board of impartial experts, who shall draft regulations for him, with due regard to the practical exigencies of the situation, that is, the competition of other states, the expense imposed on the employer by the regulation, etc. I should favor the creation of two such boards, one on Safety and the other on Sanitation. The Safety Board should consist of a representative employer, a representative wage earner, an engineer, a lawyer and an economist. On the Sanitation Board there should be in place of an engineer an expert on hygiene, and in place of the lawyer a physician. I believe that there is now enough interest in these vital questions of safety and sanitation to make it possible to create such boards to serve without pay, and that they would be most helpful to the Commissioner of Labor in deciding the difficult questions that would come before him if he were empowered to draft detailed regulations for different industries to make them conform to the general requirements of the labor law. As in Wisconsin, so in the State, the regulations prepared by these boards should be subject to review by some designated court, so that in the course of time the judges of that court would become experts on questions of this sort that might come before them.

The temptation is great to supplement these views on the more fundamental questions with which your Commission is concerned with detailed answers to other questions, but I refrain from doing so, as I believe the most valuable service you can render the State at this time, is in connection with the solution of these fundamental problems.

## ACCIDENT PREVENTION.

JOHN CALDER, *Manager, Remington Typewriter Company.*

(1) *Some Facts About Accident:*

One of our authorities on industrial mortality in the United States has estimated that the deaths amongst adult male wage-earners alone, due to accidents, amount to 35,000 a year and that the non-fatal injuries of occupation cannot be much less than two millions additional.

Such figures take no account of the many accidents to females and young persons and are based on data which is admittedly incomplete and below the mark.

It is staggering to find that in a single year of peaceful industry we kill and wound, without intent, more people than in several great military campaigns where disablement is deliberately pursued with all the engines of war which science can devise.

From 25 years' experience in factories and the investigation of some thousands of accidents, I have found that for such casualties the responsibility is pretty evenly divided between indifferent employees and neglectful employers.

I believe that factory accidents are due chiefly to the following causes:

*Ignorance; carelessness; unsuitable clothing; insufficient lighting; dirty and obstructed workplaces; neglect of fire precautions; defects of machinery and structures; absence of safeguards and of safeworking supervision.*

Not all our accidents, however, are preventable and nothing is to be gained by blinking the fact. Many of them are purely fortuitous and accidental in the most literal sense, no blame being attachable to anyone.

Yet when every allowance is made for inevitability, I am firmly convinced from a lengthy practical experience that at least *one third* of all our factory injuries can and ought to be prevented by legal, administrative and practical measures which I will endeavor to describe and illustrate.



At the outset let me say that this is chiefly a matter for experts with engineering training, though in the United States a large number of such men have yet to be educated, experienced in risks, hired and called upon to show results, not merely or even chiefly in the work of State factory inspection, but as part of the organization in every factory where the upward trend in efficiency is allowed to permeate every function of the establishment.

The above scientific and practical procedure applies to the whole program of factory matters referred to your Commission, but I can deal solely at this time with accident prevention.

I direct your attention briefly to three aspects of this important matter, viz:

- (1) What the State Can Do.
- (2) What the Manufacturer Can Do.
- (3) What Some Manufacturers Are Doing.

(1) *What the State Can Do:*

(a) Because of our extensive Inter-State Commerce we need, as far as possible, *Uniform State Safety Laws*. Dangerous machinery and other appliances used in the arts — both new and second-hand — is constantly moving over State boundaries, and such danger as is inherent in the machine itself, apart from its future application, should be provided for by its maker by statutory requirement.

(b) The State safety laws should not only be uniform; they should also be definite and practical.

At present the legal responsibility for safety under such laws — often copied unintelligently from foreign statutes or a mangled compromise emerging at the end of a political session — is so tangled that it is sometimes hard for employer and inspector alike to know where they stand.

(c) The remedy is simple. Prepare such statutes only under the best expert advice. Keep them non-partisan and take a step

forward which has long been needed, by removing every permissive clause from these statutes and making the employer — and also the maker of machinery — solely responsible for the guarding of all dangerous parts or appliances which they use or originate, letting proved impracticability be the only defense for non-observance.

(d) Do not attempt to enumerate in the statute all specific dangerous machines — excepting of course elevators and common utilities in structures, in power generation and transmission.

Such a catalogue is attempted in nearly every State statute we have, but it is always inconsistent and imperfect, and prevents progress in industrial safety.

(e) Catalogue rather in the law the “dangerous mechanical elements” which are found on machinery and appliances. These are well known to engineers and less than a dozen in number and comprise the following:

(1) All engaging toothed or other gears, rolls, drums and slides of every description on any machine.

(2) The spaces between fixed and moving parts of any machine, or between the latter and structures near it, leaving insufficient working clearance — in no case less than eighteen inches — for any person employed thereon or near it.

(3) Pulleys and clutches.

(4) Belts, bands and driving chains.

(5) Flywheels and starting balance wheels.

(6) Shafting and spindles and all couplings or projections thereon or upon reciprocating or other moving parts of machines.

(7) Counter-weights and balance gears and their suspensions.

(8) The actual element on every machine which comes into contact with the work and cuts, shears or otherwise operates upon

the latter, for instance the circular saw blade on the saw mill, the punch and die in the press, the revolving cutter in the milling machine, etc., etc.

Insist that these elements be always guarded where found "unless they are of such form and in such position as to be equally safe to all as if guarded" and you will have, without listing thousands of machines, a working category of machinery risks.

(f) These steps will relieve the factory inspectors entirely of their present impossible burden, viz; their duty in so many dangerous cases to take the initiative and *create* the obligation on the employers part by serving notice to safeguard.

No possible force of inspectors will make much progress in safety work unless the onus to protect the worker is placed fairly and squarely on the employer's shoulders and on those of the negligent maker of appliances.

(g) At present the law practically *invites* the employer, in many cases of danger, to create risks freely and do nothing towards safeguarding until an inspector, who can only visit the plant once a year, happens to make a complaint or recommendation. Even then, if legal process results, it is a long drawn out one with a very doubtful issue.

(h) This unbusinesslike procedure would be swept away at once if the obligation to safeguard rested upon the employer from the moment of starting a dangerous machine and at all times thereafter. Meanwhile, the inspector of factories, if he is an expert with a secure and honorable future in the service of the State, has ample scope for educational work especially amongst the owners of the small plants and for occasional punitive and disciplinary measures based on the clear obligation which the courts will respect and uphold.

(i) In recent years this task of industrial betterment, owing to the wholly inadequate financial assistance afforded Labor Commissioners, has been largely performed by our well-trained casualty

insurance inspectors, so far as their policy holders are concerned, and by the engineers and executives of many corporations who have given their experience freely to the public.

(j) It is too soon yet to try to estimate the work of our strengthened and reorganized State Factory Department, which got into operation only this fall. All that has been done recently has been in the right direction. I believe that we should increase the number of engineering experts on the State staff and should seek to sever for all time the last possible connection of our Factory Department with political influence and patronage. Until this is done, it will not command the absolute respect and confidence of the employers and workmen.

To sum up, what can the State do in the premises?

(1) It can give New York a better, simpler, more scientific and effective safety law, and can promote uniform State action on this subject and on accident reporting, which is the real source of information as to what is actually transpiring in our factories.

(2) It can place the safeguarding initiative and obligation fairly and squarely upon the men who create the accident risk, viz; the employers and the machinery makers, and *not* on the inspector as at present; the latter can never be other than an occasional skilled visitor, reporter and adviser, and he cannot be ubiquitous.

(3) It can coordinate through its experts, the safeguarding of the best plants in the State—these are our true safety museums—and attempt an educational task, long overdue but not expensive, viz, the illustration by special bulletins, of the various trade risks and their practical remedies.

(4) It can provide for compulsory registration of all existing factories and every new factory. I do not favor licensing such places except in fire protection, for accident risks are constantly changing.

(2) *What the Manufacturer Can Do:*

When we consider the history of factory legislation and administration in this State and the nature of the financial and material provision for enforcement of the labor laws, we are not surprised that our manufacturers had difficulty in believing that serious observance of these statutes was expected by the Legislatures which enacted them and starved the department charged with their administration.

In brief, what can the manufacturer do?

(1) He can see that the principles of safeguarding and safe-working in industry are made as much a part of the education of young engineers at college and young foremen in the plants as are those of efficiency and conservation in other directions. This one duty conscientiously fulfilled is fraught with more good to the industrial community than all the statutes ever penned on the subject. With this provision naturally goes the progressive education of the workmen also. In other words, the State may give valuable help but it can never do the work, whereas the manufacturer determined to have "safety" can get it without asking Society or "all-of-us" for any assistance whatever.

(2) He can place the responsibility for the safeguarding of his plant upon the mechanical engineer, for the secret of repeated preventable accidents in any plant is an open one, viz; that whatever is permitted to be anybody's or everybody's business is in daily life, as we well know, nobody's business.

Committees of safety may locate accident risks, but the design and installation of well-considered, consistent, durable safeguards need the close attention of a competent engineer.

In a matter such as this, the attitude and action of the mechanical executives of a factory are all important, and give the key-note on "safety" to the whole plant.

It is because such a source of betterment has a hundred chances to one over an inspector for preventing accident that I desire to see a compelling legal obligation constantly lying upon the em-

ployer such as has been so successful in the United Kingdom and in Europe.

Lastly consider

(3) *What Some Manufacturers are Doing:*

Many manufacturers no longer desire to take any advantage of the numerous grave omissions in the text, obligations and administration of our present safety laws.

Some are treating the subject as an ordinary engineering problem in which they have set a far higher standard for themselves than the State, and are living up to it regardless of the lower requirements of the statutes.

Others wish, but are unable to do likewise and are asking for advice and help from a inadequately manned State Bureau.

## CLASSIFICATION OF OCCUPATIONAL DISEASES.

DR. W. GILMAN THOMPSON, *Cornell Medical School.*

METAL POISONING CASES occurring during the past 8 years (from 1903 to 1911) in the wards of *Bellevue Hospital* and the Out-Patient Department of the *Medical Clinic* of the *Cornell University Medical College* in New York City:

	<i>Acute.</i>	<i>Chronic.</i>
LEAD POISONING:		
Bellevue . . . . .	23	164
Cornell . . . . .	3	48
	<hr/>	<hr/>
Total . . . . .	26	212
	<hr/>	<hr/>

Chronic *Arsenic* poisoning during the same period, 4 cases.

Chronic *Mercury* poisoning during the same period, 3 cases.

Chronic *Chromic acid* poisoning during the same period, 1 case.

Chronic *Brass* poisoning during the same period, 12 cases.

Submitted by

PROF. GILMAN THOMPSON.

TENTATIVE CLASSIFICATION, submitted by *W. Gilman Thompson, M. D., Professor of Medicine in the Cornell University Medical College in New York City: Visiting Physician to the Bellevue Hospital, late Visiting Physician to the New York and Presbyterian Hospitals.*

NOTE.—This classification is based upon the medical point of view.

A. *Occupations.*

B. *Harmful Substances.*

C. *Harmful Conditions.*

D. *Diseases.*

## A. OCCUPATIONS. Workers in Hazardous Trades.

I. *Workers in Harmful Substances:*

1. Workers in metals.
2. Workers in dusts.
3. Workers in gases, vapors and fumes.
4. Workers in infective materials (hides, anthrax, etc.).

II. *Workers Under Harmful Conditions:*

1. Heat and moisture.
2. Excessive light.
3. Compressed air.
4. Confined air.
5. Confined positions, nerve strain and fatigue; the "Occupation Neuroses."
6. Eye and ear strain.

## B. HARMFUL SUBSTANCES: (1) Metals, (2) Dusts, (3) Gases, vapors and fumes.

- (1) METALS: antimony, arsenic, brass, copper, iron, lead, manganese, mercury, phosphorus, silver, steel, tin, zinc.

(a) *Lead Occupations:*

Lead miners.

Makers of white and red lead.

Plumbers (solder).

Gas-fitters (red lead).

Painters (especially house painters and those who sandpaper the paint on walls, carriages, automobiles, tram cars, etc.).

Putty makers.



B. HARMFUL SUBSTANCES — *Continued.*(a) *Lead Occupations — Continued.*

Solderers of tin, brass, zinc, copper, etc.  
Makers of tinfoil and metal bottle caps.  
Workers in storage batteries.  
Printers, type founders and setters.  
Jewelers and workers in electric connection (solder).  
Workers in brass foundries and brass polishers.  
Polishers of glazed pottery.  
White rubber workers.  
Makers of car buffers and brakes.  
File makers.  
Harness makers.  
Users of amalgams (dentists, etc.).

(b) *Other Metal Occupations:*

Antimony: workers in pigments.  
Arsenic: Twenty-seven trades, including wall paper, artificial flowers, chemicals, glass, oil-cloth, etc.  
Brass and tin (same hazard as lead, derived from solder and amalgam).  
Bronze powders, makers of bronzed articles (various metals).  
Copper miners, smelters, electroplaters.  
Iron and steel (mechanical action only, causing injury to lungs [pneumokoniosis] and to eyes.  
Manganese (pigments and alloys).  
Mercury: Hat pressers, workers in explosives, makers of mirrors, mercurial pumps, barometers and thermometers, etc.; gold and antimony miners.  
Gold cyanid.  
Phosphorus (workers in matches).  
Silver (poisonous chiefly as a nitrate), mirror makers, electroplating.  
Zinc, makers of white paint, painters.

## (2) DUSTS:

(a) *Insoluble Inorganic Dusts* (irritating the respiratory passages):

Flint, silica, sand (sand blasts, sandpaper).

Carbon (coal, soot).

Brick dust, marble, granite, terra cotta.

Cement.

Asphalt.

Enamel.

Glass, quartz.

Lime, gypsum.

Meerschaum.

Phosphates, guano.

Plaster.

Emory.

Diamonds.

Metal filings: lead, brass, iron and steel, etc.

(b) *Soluble Inorganic Dusts* (liable to be swallowed and absorbed):

Metal filings of lead, brass and zinc, arsenic, mercury and silver salts.

(c) *Organic Dusts*:

Sawdust, fur, skins, feathers, broom and straw, flour and grain, jute, flax (linen), hemp, cotton, wool (worsted, etc.), carpet dust, ashes and street sweepings, tobacco and tobacco box dust, hides and leather, felt, rags and paper, horsehair.

## (3) GASES, VAPORS AND FUMES:

Illuminating gas (C.O.).

Gases from coke and coal.

Carbon dioxid (brewers' vats, bakers' ovens, aerated waters).

(3) GASES, VAPORS AND FUMES — *Continued*:

Chromic acid and chlorine.

Mineral acids, sulphuric, hydrochloric, nitric, etc.

(acid factory workers, engravers, etchers and lithographers).

Mercury cyanid.

Heated lead.

Ammonia.

Naphtha (dry cleaning) and benzine.

Tar and creosote distillers..

Asphalt and petroleum products (vaseline etc.).

Wood alcohol.

Smoke (firemen).

Varnish makers, varnishers.

Arseniated hydrogen (copper refiners).

Amyl alcohol.

Dinitrobenzol.

Nitro-glycerine.

Carbon disulphid.

Chlorine, chloride of lime.

Formaldehyde.

Hydrofluoric acid.

Nitrous gases.

Prussic acid.

Pyridine.

Sulphur and sulphuretted hydrogen.

Aniline.

(d) INFECTIVE MATERIALS: Hides (anthrax, etc.).

## II. WORKERS UNDER HARMFUL CONDITIONS:

1. *Heat and Moisture*:

(a) Heat: Stokers, miners, roofers, foundrymen, puddlers, glass-blowers.

(b) Moisture: Linen weavers and spinners, clay mixers (pottery), oystermen.

(c) Heat and Moisture: Laundry women, drivers, dyers.

II. WORKERS UNDER HARMFUL CONDITIONS — *Continued*:

2. *Excessive Light*: Glass blowers, foundrymen, electric light men, X-ray workers (eye-strain, burns of skin, nervous disorders), electro-metallurgy.
3. *Compressed Air*: Caisson workers, divers.
4. *Confined Air*: (All bad ventilation.)
5. *Confined Positions and Overuse of Nerves and muscles*:  
Nerve-strain and fatigue — the "Occupation Neuroses."  
Palsy, cramps\* (writer's, telegrapher's, typewriter's)  
sciatica, neuritis, neuralgia, gastric and intestinal disorders, general "nervousness" and insomnia, deformities of chest from cramped positions (tailors.)  
Effect of pressure, blows, vibrations, repeated muscular contractures. Position in standing (motormen, etc.), leaning toward one side as at a bench.  
Vaso-motor disturbances, reflexes, spasticity, dysaesthesia.
6. *Ear-Strain*:  
Boiler-makers, rivetters, gunners.

## D. DISEASES:

## I. Diseases of the Respiratory System:

- (a) Due to hard inorganic dusts: Bronchitis, emphysema, pneumokoniosis (cirrhosis of the lung.)
- (b) Due to soft organic dusts: Rhinitis, coryza, laryngitis, acute and chronic bronchitis, asthma, lung abscess.
- (c) Associated diseases: Tuberculosis, pneumonia.

## II. Diseases of the Circulatory System:

Enlargement of the heart, arteriosclerosis, aneurism, varicose veins.

D. DISEASES — *Continued*:

## III. Diseases of the Kidneys:

Chronic Bright's disease (chronic interstitial nephritis.)

## IV. Diseases of the Alimentary System:

Chronic dyspepsia, chronic gastritis, gastric ulcer, chronic constipation.

## V. Diseases of the Skin:

Ulcers, eczema, chronic fissures, etc.

## VI. Diseases of the Nerves and Muscles:

Paralyses, spasm (tic), tremors, cramp, pain, neuritis, neuralgia, sciatica, muscular atrophy, insomnia.

## VII. Diseases of the Eye and Ear:

Conjunctivitis, optic neuritis, deafness, etc.

## INFLUENCE OF:

Alcoholism.

Syphilis.

Foul air.

Poor food:

Fatigue and worry.

## ASSOCIATED DISEASES:

Tuberculosis.

Pneumonia.

Chronic bronchitis.

CONDENSED CLASSIFICATION USED FOR COLLECTING DATA IN  
PROF. GILMAN THOMPSON'S Clinic.

OCCUPATION DISEASES.

I. DISEASES OF THE RESPIRATORY SYSTEM:

*Solid Irritants; Fumes.*

[A] SOLID IRRITANTS:

1. Sharp insoluble mineral dusts, as steel, silica, emery, glass, flint.
2. Soluble metal dusts, as lead filings.
3. Soft organic dust, as particles of cotton, wool, grain, feathers, etc.

INVESTIGATE ESPECIALLY: weavers, spinners workers in fur, feathers, flax, jute, wool, horsehair, cotton, tobacco, grain elevators, street sweepers, subway and tunnel employees, ashmen, coal heavers, stokers, firemen, chimney sweepers, plasterers, cement grinders, pottery polishers, porcelain workers, grinders of meerschaum, scissors, knives, needles, etc., workers in leather, skin and paper, wood-sawyers, stone-cutters, brass polishers, filers of iron and steel, brick makers, emery grinders, diamond and glass cutters.

[B] TOXIC FUMES:

Workers in asphalt, chromic acid, engravers and etchers, copper refiners (arseniated hydrogen), hat pressers (mercury), beer brewers ( $\text{CO}_2$ ), matches, gas house workers, wall papers (arsenic), dyers, workers in veneer, wood alcohol, benzine, mercury cyanid, di-nitro-benzol;  $\text{H}_2\text{S}$  and  $\text{CO}$  fumes, aniline oil, acetelene, tar, creosote, nitro-glycerine.

## II. METAL POISONING DISEASES.

## [A] LEAD:

Painters, makers of white lead, type founders and setters, solderers and tinsmiths, pottery glazers, gas filters (red lead), rubber (white lead), metal cork caps, file makers, electrical equipment (solder.)

## [B] OTHER METALS:

Mercury: Workers in mirrors, mercurial pumps, incandescent lights, barometers.

Zinc oxide paint: Workers in bronze, copper and brass (ascertain per cent of alloy used), tin, bronze, powders, workers in wall papers and feathers (arsenic), gold cyanid.

## III. TRAUMATIC AND OCCUPATION NEUROSES.

Nature of the trauma or strain. Duration of the occupation. Hours of work. Nerves or muscles affected. Neuritis, pain, cramp, paralysis. Concentration of attention, as in caring for machines. Strain of eyes and ears. Effect of pressure, blows, vibrations, repeated muscular contractures. Position in standing, leaning toward one side, or sitting in cramped postures as in tailoring. Interference with proper lung expansion, and deformities of chest. Gastric neuroses from errors in diet and occupation. General "nervousness" from overwork and strain.

Examine patient for vaso-motor disturbances, reflexes, dysesthesia, spasticity.

### Blank Form for Recording Cases of Metal Poisoning.

<i>Metal poisoning diseases.</i>	Diagnosis	Case No.	Hist. No.
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Name: \_\_\_\_\_ Age: M. F. S. M. W.

**Occupation :**

Occupation in detail:

Drinker (hard, moderate, abstainer). Syphilis (years)

Years employed	Hours of work	No. of co-workers	Are they also affected?
1	10	1	
2	10	1	
3	10	1	
4	10	1	
5	10	1	
6	10	1	
7	10	1	
8	10	1	
9	10	1	
10	10	1	
11	10	1	
12	10	1	
13	10	1	
14	10	1	
15	10	1	
16	10	1	
17	10	1	
18	10	1	
19	10	1	
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90	10	1	
91	10	1	
92	10	1	
93	10	1	
94	10	1	
95	10	1	
96	10	1	
97	10	1	
98	10	1	
99	10	1	
100	10	1	

### Prophylactic instructions ?

Washing facilities (good, poor). Lunch eaten where?

Ventilation of room?                      Masks, respirators (for fumes)

Room cleaned, how often?

Details of metal: dust, filings, fumes, alloys (composition) Solder?

Port of entry: mouth, nose, finger-nails.

Protective agents: gum or tobacco chewing? Milk? Wife's miscarriages?

*Physical examination:* gums                      teeth                      beard?  
arteriosclerosis                      blood pressure                      heart, size  
murmurs    lungs  
digestion    constipation  
nervous system: neuritis                      cramps                      palsy  
hands: eczema                                      fissures                                      ulcers

*Blood examination:*

Hb.%	red cells	white cells
	basophiles	

*Urine examination:* alb.                      casts                      sp. gr.                      lead?

**Eyes:** trauma                      injury by heat, light

*Acute symptoms* at beginning of work                      vertigo

Gastrointestinal nervousness

*Synopsis of present symptoms:* chief complaint



**Blank Form for Recording Cases of Respiratory Diseases.***Respiratory diseases:* dust, fumes: Diagnosis

Case No.

Hist. No.

Name

Age

M. F.

S. M. W.

Occupation:

Occupation in detail:

Drinker (hard, moderate, abstainer). Syphilis (years)

Years employed

Hours of work

No. of co-workers

Are they also affected?

Prophylactic instructions?

Ventilation: Fans, hoods, windows (open, shut). Masks?

Respirators?

Room cleaned, how often?

Exposure to cold, heat or wet?

*Physical examination of pharynx*

lungs

heart

*General condition:* Weight

anemia, Hb. %

r. b. c.

w. b. c.

digestion

cough

sputum exam.

Acute symptoms at beginning of work; coryza, headache:

*Note especially:* recurrent bronchitis, asthma, dyspnoea, rhinitis, laryngitis, vertigo, pneumokoniosis, tuberculosis.

Onset of tuberculosis in relation to duration of employment.

*Present symptoms:* chief complaint

## 3. SEVEN DAY LABOR LEGISLATION.

JOHN A. FITCH, *The "Survey."*

October 31, 1911.

MR. ABRAM I. ELKUS, *Factory Investigating Commission,*  
165 Broadway, City:

DEAR SIR:

According to your request, I am sending you with this a statement, which can hardly be called a brief, designed to throw a little light on the situation in the continuous industries.

I have not thought it proper to draft a bill for your consideration, though I have tried to indicate what I think is the proper form of law. In my statement I have included some of the most significant things to be found in court decisions relating to this subject.

With this statement, I am including two tables, indicating the amount of seven-day work in certain callings in New York and Minnesota. I am sending it to you for these two States simply because there is no data available for any other States in the Union that I have been able to find. My reason for sending you figures for another State is simply so that you can judge from the figures there represented something of what the figures would be in New York, if we could obtain them. For example: in the Minnesota list there are 11,358 seven-day workmen in hotels and restaurants; we have no figures whatever for hotels and restaurants in New York State, but if we were to obtain them, we should find, of course, a very much larger number than are employed in the State of Minnesota.

The table which I am sending you, showing seven-day workmen in New York, you will find very incomplete. I have listed on this table all of the important industries which I personally know to employ workmen seven days a week. For many of these occupations I have no figures whatever. It will serve to show you, however, how extensive is the field covered by the continuous industries.

Under separate cover, I am sending you a copy of the bulletin of the New York State Department of Labor, for September, 1910. On pages 377 to 403 inclusive, you will find a discussion which I prepared on this subject of seven-day labor, in which I go into the constitutional question involved. On pages 450 to 464 inclusive, you will find tables giving extensive information on this subject. On page 464 you will find citations to all of the important court decisions that have been made in this country on the question of the constitutionality of the Sunday laws.

If after examining this material you care to have me come before the Commission, I shall be glad to do so. I do not think that I shall be able to add anything to the information which I am now sending you. I shall be glad, however, if you desire, to go into greater detail or to express an opinion more fully than I have here.

Yours very truly,

JOHN A. FITCH.

#### I. AMOUNT OF SEVEN-DAY WORK.

##### (1) *In New York:*

Out of a total of 1,138,965 wage earners in factories in New York, reported to the Factory Inspection Bureau in 1909, 30,467 were reported as working an excess of 63 hours per week. This is 2 and 67-100 per cent of the total number of wage earners reported.

Sixty hours per week indicates a ten-hour day six days in the week. More than 63 hours indicates the probability of Sunday work.

From personal examination of the files of the Factory Bureau, made when I was an employee of the State Department of Labor, I know that these wage earners who worked an excess of 63 hours per week, varied generally in the time of their weekly employment from 65 hours to 119 hours; the former indicating ten hours of regular work for six days and one-half day on Sunday; the latter indicating an average of seventeen hours per day for a full seven days per week. This latter schedule existed in a certain canning establishment.

In March, 1910, the secretaries of a considerable number of labor unions in the State reported to the State Bureau of Labor Statistics, 335,814 members. Out of this total they reported 35,742 (10 and 6-10 per cent of the whole number) as working regularly on Sundays. Most of them, all but 698, worked every Sunday. Twenty-eight thousand two hundred and eighty-three (8 and 4-10 per cent of the whole number reported) worked as long on Sunday as on week days. The remainder worked a shorter schedule.

Since organized labor is naturally opposed to seven-day labor, it would be natural to suppose that the proportion of seven-day labor in the unorganized trades would be much larger.

(For the figures quoted above see report of Bureau of Factory Inspection for 1909; table 14, page 281 and Bulletin of the New York Department of Labor, September 1910; table 12, pages 450-451. See full table accompanying this report, showing the number of seven-day workmen by industries.)

(2) *Massachusetts:*

In 1907 a Joint Committee of the Massachusetts Legislature, after an investigation, reported that 221,985 men in sixteen trades and callings, *not including factories*, were employed on Sundays in that State. (Massachusetts House Document No. 1160.)

(3) *Minnesota:*

The report of the Bureau of Labor of the State of Minnesota for 1909 and 1910 reports 98,558 workmen working seven days per week in that State. (See accompanying table for number of seven-day workers by industries.)

## II.

All of these reports are incomplete and fragmentary. Minnesota has come nearer than any other State apparently to recording the full number of seven-day workers within her borders.

In New York we have no means of ascertaining with any accuracy at all the number of seven-day workmen. For example:

the hotels, restaurants and railroads probably employ more workmen seven days per week than are to be found in any other calling. Yet hours of labor for these enterprises are not reported to any public agency. In other States, excepting Massachusetts, no attempt of any importance has ever been made to ascertain the extent of seven-day operation. Hence it is evident that one of the first necessities is an investigation to ascertain the number and character of continuous industries, whether they are necessarily continuous, and the number of workmen they employ.

### III. LEGISLATION.

#### (1) *Necessity of it:*

The old colonial Sunday necessarily has passed away. The Sunday laws have been inadequate to preserve the Sabbath intact, and they have been of even less effect as a protection to workingmen. A consideration of the industrial conditions actually existing at the present time reveals the fact that neither is the Sabbath preserved nor are workmen protected by the present laws.

#### (2) *A Rest Day Law. (One day in seven.)*

In Europe, Switzerland adopted such a law as far back as 1878, and Spain followed in 1904. Now most of the European countries have adopted the principle. Canada on the north of us and Chile and Argentina on the south have enacted it into law.

The principle is simply this: While it may be necessary for an industry to operate continuously every day in the week, it is not therefore necessary for workmen to labor every day in the week. Accordingly, it may be required that those industries which have to be in operation on Sundays, shall allow every employee at work on that day a full day of rest on some other day. Under such a law, either the industry will have to stop one day a week or else the working force will have to be increased by one-sixth and the employees receive their rest period on different days by rotation through the week; that is, one group of employees would have Sunday as a rest day, another Monday, and so on through the week. Thus the full quota of workmen would always be employed

and the industry would not suffer, but every man would have a day of rest. Such a law protects the industry and the workmen both, and it naturally tends to protect the Sabbath much more than the laws now in existence. It penalizes continuous operation by requiring the addition of one-sixth to the working force and hence to the pay-roll. Accordingly, the seven-day industries that are not necessarily continuous would tend to go back to a six-day schedule and the day of rest would naturally be Sunday.

This is a system that the American Telegraph and Telephone Company adopted some years ago. It is a custom followed by most newspaper offices, and now it is being adopted by the U. S. Steel Corporation, the Lackawanna Steel Co. and by other large steel companies.

(3) *Form of Law Required:*

(a) Sunday should be designated as the universal day of rest.

(b) Continuous industries should be licensed. Switzerland has, since 1876, licensed those industries which have to be operated at night. This brings the industries to a special degree under the control of the State. The Switzerland law particularly specified that no industry may be licensed to operate at night unless the working time is no more than eleven hours.

The Commissioner of Labor is the logical officer in this State to administer such a law and to issue licenses at his discretion, when he is convinced that the industries are of necessity continuous. The law should prescribe carefully what industries are to be considered as continuous industries. It is very important that this legislation should be under the control of the Department of Labor. At present, Sunday laws in this country are in the penal code, and the officials of the Labor Department have nothing to do with their enforcement.

(c) Having designated Sunday as the general rest day, and having granted exceptions to this rule in the case of industries that are necessarily continuous, the law should provide that no workman should be required or permitted to work for his employer more than six days per week. This will compel the em-

ployer to grant each man a day of rest some time during the week. The law must also provide fully for the protection of every man's religion; so that if some other day than Sunday is observed by any man as a day of rest or worship, he should not be interfered with if he desires to pursue his regular work in a quiet and orderly manner on Sunday. The only reason for designating Sunday as a day of rest is that a large majority of the people in this country do already observe that day.

#### IV. CONSTITUTIONALITY OF ONE-DAY-IN-SEVEN LEGISLATION.

The principle underlying rest-day legislation, such as is here recommended, has been approved by the courts so often that there can be little doubt that such legislation would be declared valid. The Sunday laws now on the statute books are upheld solely as police regulations.

As long ago as 1853 an Ohio court went on record to the effect that a Sunday law is a police regulation, neither weakened or strengthened by the fact that the day of rest enjoined is the Sabbath. "Wisdom requires that men should refrain from labor at least one day in seven, and the advantages of having the day of rest so fixed, and so fixed as to happen at regularly recurring intervals, are too obvious to overlook. It was within the constitutional competency of the General Assembly to require this cessation of labor and to name the day of rest."

Bloom v. Richards, 2 Warden, 388.

In 1877 the Supreme Court of Massachusetts said, "The legislative authority to provide for its (Sunday's) observance is derived from its general authority to regulate the business of the community and to provide for its moral and physical welfare."

Commonwealth v. Has, 122 Mass. 10.

The following citations indicate similar views not only of State Courts, but of the Supreme Court of the United States:

"That Sunday is kept as holy by most Christian denominations, neither adds to, nor detracts from the validity of the enact-

ment. Had any other day of the week been selected, the enactment would have had the same binding force."

Richmond v. Moore, 107 Illinois, 429.

"There can be no well-founded doubt of its (Sunday Law) being a police regulation . . . for the frequent and total suspension of the toils, cares and strain of mind or muscle incident to pursuing an occupation or common employment, is beneficial to every individual, and incidentally to the community at large, the general public. Leisure is no less essential than labor to the well-being of man. Short intervals of leisure at stated periods reduce wear and tear, promote health, favor cleanliness, encourage social intercourse, afford opportunities for introspection and retrospection, and tend in a high degree to expand the thoughts and sympathies of people, enlarge their information and elevate their morals. . . . Without frequent leisure, the process of forming character could only be begun; it could never advance or be completed, people would be mere machines of labor or business—nothing more."

"If a law which, in essential respects, betters for all the people the conditions, sanitary, social and individual, under which their daily life is carried on and which contributes to insure for each, even against his own will, his minimum allowance of leisure, can not be rightfully classed as a police regulation, it would be difficult to imagine any law that could."

Hennington v. The State, 90 Ga. 396.

(3)

"It is to the interest of the State to have strong, robust, healthy citizens, capable of self-support, of bearing arms, and of adding to the resources of the country. Laws to effect this purpose by protecting the citizens from overwork, and requiring a general day of rest to restore his strength and preserve his health have an obvious connection with the public welfare. Independent of any question relating to morals or religion, the physical welfare of the citizens is a subject of such primary importance to the State, and has such a direct relation to the common good, as to make



laws tending to promote that object proper under the police power, and hence valid under the constitution. . . . The statute under discussion tends to effect this result, because it requires persons engaged in all kind of business that takes many hours each day, to refrain from carrying it on during one day in seven. This affords an opportunity, recurring at regular intervals, for rest, needed both by the employers and the employed, and the latter, at least, may not have the power to observe a day of rest without the aid of legislation."

People v. Havnor, 149 N. Y. 195.

"The statute under consideration is not class legislation, nor does it violate any of the provisions of the constitution. It is clearly within the constitutional power of the Legislature to require this cessation of labor for one day in seven, and to designate the day of rest."

State v. Nesbit, 8 Kan. App, 104.

"The Legislature having, as will not be disputed, power to enact laws to promote the order and to secure the comfort, happiness and health of the people, it was within its discretion to fix the day when all labor, within the limits of the State, works of necessity and charity excepted, should cease."

Hennington v. Georgia, 163 U. S. 299.

## NUMBER OF MEN ENGAGED IN SEVEN DAY LABOR IN MINNESOTA.

(Report Minn. Bureau of Labor, 1910, Table D, pp. 104-119.)

<i>Food Products:</i>		Livery and Drayage..	2,221
Bakeries. . . . .	56	Shoe Shining . . . . .	81
Brewing. . . . .	96	<i>Retail Mercantile Estab-</i>	
Confectionery. . . . .	32	<i>lishments:</i>	
Creamery, Past. and		Amusements. . . . .	401
Ice Cream . . . . .	532	Bakery Goods . . . . .	11
Flour and Grist Mills	62	Billiard and Pool... .	153
Grain, cleaning and		Bowling Houses,	
storing. . . . .	2	Books and Station-	
<i>Iron and Steel Products:</i>		ery. . . . .	2
Autos and Bicycles..	95	Clothing and Gents'	
Blast Furnaces . . . .	279	Furnishings. . . . .	19
<i>Paper and Pulp Pro-</i>		Confectionery and	
<i>ducts:</i>		Cigars. . . . .	1,171
Paper and Pulp Mills	299	Dairy Products . . . .	67
<i>Chemicals and Allied</i>		Drug Stores . . . . .	1,081
<i>Products:</i>		Dry Goods and No-	
Oils. . . . .	377	tions. . . . .	6
Tallow and Fertilizers	4	Furniture and Under-	
<i>General Contracting</i> . .	218	taking. . . . .	25
<i>Public Utilities:</i>		General Mdse. . . . .	173
Heat, Light and		Groceries. . . . .	85
Power. . . . .	2,320	Hardware. . . . .	5
Telegraph and Tele-		Ice Dealers . . . . .	13
phone, Express and		Jewelry and Optical	
Messenger Service. .	3,207	Goods. . . . .	9
<i>Transportation:</i>		Meat Markets . . . . .	46
Railroads. . . . .	49,166	Nurseries and Florists	21
Street Railways . . .	3,705	Photographers and	
Ferries. . . . .	7	Photograph Sup-	
<i>Mining Operations</i> . .	20,678	plies. . . . .	48
<i>Personal Service:</i>		Toys and Novelties..	6
Barber Shops and		<i>Wholesale Mercantile</i>	
Bath Rooms . . . .	37	<i>Establishments:</i>	
Hospitals, College and		Commission Mer-	
other Institutions..	180	chants. . . . .	99
Hotels and Restau-		<hr/>	
rants. . . . .	11,358	Total. . . . .	98,558
Laundry Work . . . .	5	<hr/>	

## LIST OF CONTINUOUS INDUSTRIES IN NEW YORK AND STATISTICS OF WAGE EARNERS SO FAR AS AVAILABLE

INDUSTRIES	WAGE EARNERS REPORTED IN SPECIFIED INDUSTRIES					
	BY N. Y. FACTORY INSPECTION BUREAU			BY TRADE UNION SECRETARIES		
	Total No. reported	No. working 63 hours or more each week	Per cent. working 63 hours	Total No. reported	No. working 7 days a week	Per cent. working 7 days a week
I. Transportation:						
1. Steam railroad.....				15,604	14,765	94.6
2. Steam railroad shops...	22,086	1,882	8.44			
3. Electric railroads.....						
4. Navigation.....				1,939	1,929	100.0
5. Cabs and teaming.....				13,300	3,743	28.1
6. Ice and milk delivery...						
II. Communication:						
1. Telegraph.....				1,339	1,334	99.7
2. Telephone.....						
3. Newspapers.....						
III. Manufacturing:						
1. Cement and lime.....	1,375	980	71.3			
2. Smelting and refining...	3,168	228	7.2			
3. Ore crushing.....	399	116	29.6			
4. Blast furnaces.....	1,855	1,529	87.8			
5. Rolling mills and steel works	10,688	4,584	42.9			
6. Drugs and chemicals...	13,907	897	4.3			
7. Wood alcohol and essential oils.....	1,087	591	54.4			
8. Mineral oils.....	2,841	121	4.2			
9. Paper and pulp.....	12,991	5,660	43.5			
10. Flour and cereals.....	4,172	459	11.0			
11. Food products.....				7,927	500	6.3
12. Beverages.....				6,772	1,707	25.2
13. Sugar and molasses...	5,155	1,911	37.0			
14. Canning, etc.....	12,037	910	7.5			
15. Baking—bread, etc.....	16,749	207	1.2			
16. Artificial ice.....	912	515	56.4			
17. Heat, light, power....	9,049	2,572	28.4			
IV. Personal service:						
1. Hotels and restaurants...				3,186	1,002	31.4
2. Domestic servants.....						
3. Bootblacks.....						
4. Drug clerks.....						
5. Barbering.....				2,254	294	13.0
V. Miscellaneous:						
1. Public employment						
Postoffice employes...				13,925	6,746	48.4
2. Stationery engineers...				5,020	2,244	44.7

## REST DAY LEGISLATION IN FOREIGN COUNTRIES.

The Foreign Rest Day Laws may be divided into three classes, those naming Sunday as the regular day of rest, but allowing continuous industries to operate on Sunday provided every employee gets one day of rest a week; those requiring a weekly day of rest, without designating the day; and those requiring regular periods of rest of less than a day in duration, at stated intervals. The greater part of the legislation comes within the first class.

The following is a summary of the foreign rest day laws. They have been secured from various compilations, to which citations are given. A considerable number were taken from the English edition of the Bulletin of the International Labor Office, cited (E. B.) the publication of the International Association for Labor Legislation. In such cases the citation to the bulletin is given together with the original citation.

Together with the laws, the orders and decrees which have the force of laws are presented. No attempt has been made, however, to digest the voluminous decrees which have been issued explanatory of the original statutory provisions. The full text of the more important ones may be found in the International Labor Bulletin, together with citations to the others.

## ARGENTINE REPUBLIC.

*Law of September 6, 1905, on Sunday Rest.*

(*Annuaire de la législation du travail*, vol. 9, 1905, pp. 43  
Bruxelles, 1906.)

**Art. 1.** Prohibits Sunday work in the capital of the Republic, either for any one else, or for one's self, if in public, in manufacturing establishments, shops, mercantile houses and other establishments or workplaces, without any exceptions except those provided in the present law and in regulations which may be issued for its enforcement.

**Art. 2.** Excepted from the preceding prohibition, are:

1. Work not susceptible of interruption on account of the nature of the wants it is to supply, or on account of technical

reasons, or in order to avoid serious damage to the public interest or to the industry itself.

2. Necessary work of repairing and cleaning, which, if performed during the week, would bring about a stoppage of work in industrial establishments.

3. Work necessary in order to avoid threatening injury, either on account of accidents of nature, or on account of temporary circumstances which must be utilized.

In each case regulations shall fix the weekly rest to be allowed to persons affected by these exceptions.

Art. 3. No exception to the obligation of a weekly rest shall apply to women and children less than 16 years old.

Art. 4. The provisions of this law shall not apply to domestic servants.

Art. 5. Cafés shall be closed on Sundays.

Art. 6. Unless proof to the contrary is furnished, employers shall be held responsible for violations of the present law, and shall be fined for a first offense, one hundred pesos, and in case of a second violation, the penalty shall be double this fine or fifteen days in jail.

*Decree issued November 18, 1905, in accordance with act of Sept. 6, 1905, E. B. I., p. 387.*

Prohibits labor for another, or for one's self if carried on in public, in capital or Republic, from midnight Saturday until midnight Sunday. Exceptions are allowed in case of work which cannot be interrupted.

a. On account of nature of requirements which it satisfies, or of the serious loss that would accrue to the public interest by any interruption in such work.

b. For technical reasons and serious loss to public interest,

c. On account of temporary circumstances of which advantage must be taken.

d. On account of requirements satisfied and in order to prevent serious loss accruing to industry.

e. In case of processes which must be carried out because they are urgent.

Where, on account of such exceptions, work is done on Sunday, an equivalent period of rest must be granted during the week.

#### AUSTRIA.

*Law of Jan. 16, 1895, Le Travail du Dimanche.*

(Office du Travail, Belgium, Bruxelles, 1896, p. 87.)

All industrial work is to cease on Sunday from 6 a. m. and for a period of 24 hours. Exceptions are made in the case of the following:

1. Work of cleaning or repairing necessary to keep the establishments running, and which could not be performed during the week without interfering with the work or without danger to the life and health of the workers.

2. Necessary supervising.

3. Work to take inventory once a year.

4. Work of a temporary nature that cannot be delayed, on account of the interest of the public, or for reasons of safety, or in cases of necessity.

5. Personal work of the owner of an establishment, if performed without the help of workmen and not in public.

Employers employing workmen on Sunday at the kind of work mentioned in 2, 3 and 4, must keep a register, giving for each Sunday the names of workmen employed, the place and duration of employment and the kind of work performed. This register is subject to the examination of administrative industrial authorities and industrial inspectors.

Concerning the work mentioned in 3 and 4.

Employers must notify the industrial authorities before beginning the work; but if the necessity of beginning or continuing such work is not felt until Sunday, the industrial authorities must be notified as soon as the work is ended.

If the work mentioned in 1, 2 and 4 prevent the workmen from attending religious service before noon, employers must on the Sunday next following allow the workmen time to attend religious service before noon.

If the same work lasts over three hours, the workmen are entitled to a rest of at least 24 hours on the following Sunday, or if the nature of the work does not allow it, to a day of rest during the week, or in any case, to a rest of six hours two days in the week.

*Law of July, 1902, regulating Government Contract on railroad work.*

(Annuaire de la législation du travail, V. 6, 1902, p. 71.)

The law requires at least 24 hours rest on Sundays, beginning not later than 6 a. m. for all workmen on government contract work on railroads or in establishing connections therewith. Exception is made for cleaning and maintenance work necessary to continuous operation and which could not be done during the week; necessary supervision of work and other necessary work of a temporary character that must be performed in the interest of the public. There must be a record kept of the names of workmen employed on Sunday, together with the duration of their work. If the latter is more than three hours, the workmen so employed must have a rest of at least 24 hours on the following Sunday, or if this is impossible, on a week day, or a rest of six hours, exclusive of night rest, on two week days.

*Ministerial Order, May 5, 1906, E. B. I., p. 176.*

In cement stone works using hot air currents in drying chambers, Sunday work is permitted, but must be kept at a minimum of necessity. Those working over 3 hours on Sunday must have on the following Sunday 24 continuous hours of rest.

*Order of Minister of Agriculture in agreement with the Minister of Interior, relating to the employment of young persons and children in mining operations. June 8, 1907, E. B. II, p. 215.*

(R. G. B1. No. 115.)

6. "If young persons are employed on Sundays in pursuance of S. 4 of the Act of 21st of June, 1884, they shall be allowed a compensatory day of rest during the following week."

#### BOSNIA AND HERZEGOWINA.

*Order of April 20, 1907, E. B. II, pp. 361-362.*

(Gesetz und Veordnungsblatt fur Bosnien und die Herzegowina  
VIII Stock ex. 1907.)

A weekly day of rest of 24 hours must be allowed in all industrial occupations. The day of rest for Christians is Sunday; for Moslems Friday, and for Jews, Saturday. Workmen may be employed on days of rest in carrying on urgent processes, providing that notice is sent to industrial authorities. A compensatory day of rest of 24 hours must be allowed to employees who are obliged to work on the usual rest day for more than three hours.

#### BELGIUM.

*Royal Decrees, Feby. 7, 1907, and March 2, 1907, in pursuance of Act of July 17, 1905, E. B. II, No. 2, pp. XXIV, 217.*

Authorizing hair dressers of certain cities to carry on business for ten hours on specified Sundays, provided as a compensation, a half-holiday is allowed the following week.

#### CANADA.

*An Act respecting the Lord's day. July 13, 1906. E. B. III, pp. 101.*

(6 Edw. VII. c 27.)

No sales are to be made or business done or labor performed or hired to be performed on the Lord's Day, but works of neces-



sity or mercy are excepted. (These are defined in detail and include industries or businesses usually continuous. No employee may work at receiving or transmitting messages, in any industrial process or in transportation, on the Lord's Day, unless he is allowed twenty-four consecutive hours of rest during the next six days, but this does not apply where the day's work is not over eight hours.

#### CHILI.

*Law of June 26, 1907. E. B. III, pp. 37-38.*

(Boletin del Instituto de Reformas Sociales IV, No. 40, Octubre de 1907, pp. 390-391.)

Weekly day of rest must be allowed for "factories, manufactories, workshops, workrooms, houses of business, mine, saltpetre works, and generally all public and private enterprises of whatever description." The days of rest are Sundays, unless there is some express arrangement to the contrary, and January 1, September 18 and 19 and December 25. The period of rest begins at 7 p. m. on the day preceding the day of rest and ends at 6. a. m. on the day following the day of rest.

Exceptions to the above provisions are:

1. Repairing of damages due to circumstances beyond human control or to accident.

2. Operations requiring continuous work, on account of the needs which such operations satisfy, or on account of technical reasons, or in order to prevent serious injury to the public interest and to the industry concerned.

3. Enterprises of a seasonal character, and those dependent on the operation of natural forces.

4. Operations indispensable to the routine of enterprise, and which cannot be postponed, as the cleaning of machinery and of boilers, the drawing up of accounts, taking of inventories, etc.

In the case of the exceptions, there must be a day of rest for all every two weeks, which no employee can contract to renounce. Children under 16 and women are not allowed to contract to renounce the weekly rest period under any circumstances.

DENMARK.

E. B. I., p. 177.

*Act regulating work in bakeries and confectionery business, April 6, 1906.*

At Copenhagen and Fredericksburg every employee in such establishments must have twenty-four hours continuous rest each week. In other cities, sixteen hours. Men in cities named may work not over three hours either at beginning or at end of twenty-four hour period preparing yeast, etc. Men in other cities may work not over one hour at beginning or end of sixteen hours rest period at same operation. This time must be made up by equivalent period during the same week.

FRANCE.

E. B. I., p. 185.

*Act of July 13, 1906, establishing a weekly day of rest for employees and workmen.*

Provides for weekly day of rest of twenty-four hours in all establishments, commercial and industrial. The rest-day shall be Sunday, excepting where it can be shown that a simultaneous period of rest on Sunday for the entire staff of an establishment would be injurious to public interest, or would disorganize the normal working of the establishment in question. In such a case the period of rest may be given in any one of the following ways:

- a. On a day other than Sunday to the entire staff.
- b. From noon on Sunday to noon on Monday.
- c. On the afternoon of every Sunday, with a compensating period of rest one whole day in every fortnight, by rotation.
- d. By rotation to the whole, or a part of the staff.

Exception is made to observation of regular rest period in case of urgent need. Corresponding rest period must be given later.

In case of undertakings subject to interruption due to weather, interruptions in each month may be deducted from number of days of rest due the employees.

In open-air industries and in industries having to do with perishable material, the weekly rest day may be suspended fifteen times in year, but at least two rest days must come in each month. The provisions of the act do not apply to employees engaged in services of water and rail transportation.

Note.—Where continuous operation is necessary, resulting in the rotation system of rest, the result has been, in a majority of cases, to increase the labor force by one-seventh and to increase the daily wage in the same degree. (U. S. Consular Report, September, 1908, p. 90.)

*Engineers and Stokers. E. B. I., p. 450.*

*Order of Minister of Public Works, May 9, 1906, amending two orders of November 4, 1899.*

(E. B. I., p. 432.)

Requires ten hours rest and not over ten hours work in working day. Any nine consecutive days, midnight to midnight, shall have not over thirty hours work and not less than ninety hours rest.

Thirty hours continuous rest every ten days for road engineers and stokers — ten hours to be reckoned as part of the total ninety hours. May be reduced to thirty hours in fourteen days if employee sleeps at home.

Artificer engineers, thirty hours rest in fourteen days, or twenty-four in ten days when engineer has assistance of stoker. Where engineer works single-handed, thirty hours in twelve days, or twenty-four hours in eight days.

*Guards. E. B. I., p. 451.*

Period of employment on average not over ten hours work and not less than ten hours rest. In fourteen days (consecutive) not over 140 hours employment and not less than 140 hours rest.

## GERMANY.

*Decree of the Federal Council of Jany. 23, 1902, concerning employees in cafes and restaurants.*

(Soziale Rundschau, Jany., 1902.)

Apprentices and helpers over 16 years of age, in cafes and restaurants, must have one uninterrupted rest of at least eight hours every day, and those under 16, one of nine hours. In addition, there must be daily rest periods of a total duration of at least two hours, exclusive of time spent at meals. Once every three weeks there shall be, instead of one of the daily uninterrupted periods of rest mentioned above, an uninterrupted rest period of at least 24 hours. In towns having more than 20,000 inhabitants, this 24-hour period is to come every two weeks. In those weeks in which a 24-hour rest period does not fall, there is to be, besides the regular daily rest periods mentioned above, an extra rest of at least six hours, between 8 a. m. and 6 p. m.

*Notification relating to exceptions from the prohibition of Sunday work in industrial undertakings, May 23, 1906.*

(E. B. I., p. 155.)

Provides for Sunday work in glass factories, in certain cases, and provides for rest periods during week in compensation.

## CAPE OF GOOD HOPE.

*E. B. I., p. 38, Act of June 6, 1905.*

Provides for closing of shops some day in week, at 1:30, and to remain closed the remainder of the day. On such day the employees may be kept only in case of necessity and then compensating time must be given on some other day in week.

## ITALY.

*Laws of July 7, 1907. E. B. II., p. 288. (B. D. U. D. L. VIII, No. 1, Luglio, 1907, pp. 276-279.)*

All persons other than members of the employers' family, engaged in commercial or industrial enterprises, must have 24 con-

secutive hours of rest in every week. Employers must not extend the hours of work on either the day before or the day after the rest day. Law does not apply to agriculture, hunting, fishing or transportation. Exceptions are as follows: Industries dealing with raw materials of a perishable nature, as often as required; industries liable to interruption by wind or water, ten weeks in the year, in which case the period of rest must be allowed every fortnight; industries subject to periods of extraordinary pressure, six weeks in the year.

Weekly rest must, on principle, be on Sunday, but in the following industries rest may be allowed by rotation on another day: Industries with continuous fire; continuous processes, cheese-making, seasonal industries, where Sunday work is necessary for technical reasons; industries where work is necessary in the public interest, as gas works, water works, bakeries, transport undertakings, except railways, repair, etc.; where work is necessary by reason of hygiene; trades dealing in necessities, as restaurants, amusements and newspapers. Rest day other than Sunday may be provided for undertakings in the open air. Sunday afternoon holiday is imposed upon certain establishments allowed to be open Sunday morning.

#### PORTUGAL.

*Decree establishing a weekly day of rest, August 3, 1907. E. B.  
III, 1, 3.*

(Diario do Govenrs, 1907, No. 176, 9 de Agosto.)

All employees of commercial and industrial enterprises must be allowed a weekly rest period of at least 24 consecutive hours and on the day fixed as the rest day, factories, work places and commercial and industrial businesses must be closed.

Exempt from the weekly closing provision are newspaper businesses, chemists, hospitals, undertakers' businesses, bathing establishments, bakeries, restaurants, inns, eating houses, ice factories, slaughter houses, businesses for the sale of fresh fruit, garden produce, vegetables and fish, dairies, heater works, lighting and power plants, undertakings for the work of loading and unloading, telephone offices, mines, and all industrial enterprises where the sus-

pension of work would involve damage to the raw materials used therein or to the manufactured goods, or which are of such nature that work must be carried on without interruption. In these enterprises all employees must be allowed a day of rest by rotation through the week.

Sunday shall be the day of rest, except where a suspension on that day shall entail serious loss to the public interest, and in the cases of places of amusements and photographic studios. In such cases another day may be chosen. An exception is made in the case of pastry works on certain Sundays. In case Sunday is, for any reason, unsuitable as a day of rest in a particular industry or trade, the civil governor may fix another day, or readjust the rest period so that half of it may fall on Sunday and half on Monday.

Sunday rest may be suspended to facilitate rescue work, repairs that are urgently needed, or to prevent accidents, but in every case there must be, on the next day or days, a compensating period of rest.

Violation of the law is punishable by fine and imprisonment.

#### SPAIN.

##### *Law of March 3, 1904.*

(Annuaire de la legislation du travail public par l'office du travail de Belgique, 1904, p. 141.)

Sunday work prohibited in factories, work-shops, stores, fixed or movable markets, mines, quarries, docks, transportation, public works, construction, repairing or demolishing of buildings, agriculture or forestry, establishments or services dependent on the state, province or municipality, and any analogous occupations.

Exceptions are made in case of:

a. Works which cannot be interrupted either because of the needs satisfied by them, or for technical reasons, or on account of the effect on public welfare.

b. Repairing or cleaning necessary to avoid interruption of manufacturing during the week.

c. Works justified by imminent danger, accidents, or to take advantage of temporary conditions.

No more employees than are necessary shall be allowed to work on Sunday, and they shall not be employed for the whole day or two consecutive Sundays. Every employee working a full Sunday must have a full day free during the week. No exception is made allowing Sunday work to women or children under eighteen.

#### SWITZERLAND.

##### *I. Federal Laws. Law of 1872 on Transportation.*

(Le travail du dimanche. Office du travail, Belgique, 1896, v. 5, p. 236.)

Art. 9. Officers and employees of railroads shall have a rest at least on one Sunday out of three. This provision shall apply also to other enterprises of transportation authorized or owned by the federal government (steamboats, postal service, etc.).

Most of the companies refused to obey this provision, demanding the right to substitute a week day instead of the Sunday, according to the necessities of the service. In 1878 the following was added to article 9:

“For officers and employees, whose replacing on Sunday causes certain difficulties or is not practicable in the interest of safety of transportation, railroad companies may, with the approval of the Federal Council, decide that the rest on Sunday may be replaced by rest on a week day. The same may take place exceptionally for other officers and employees, if they send a request to their superior officers.”

*By law of June 27, 1890, the old system was adopted again.*

Art. 4. Officers, employees and workmen shall have 52 days of rest a year, well distributed, of which in any case 17 shall fall on Sundays. No part of the wages shall be retained on account of the rest days granted by the present law.

Art. 5. Transportation of merchandise is prohibited on Sunday. Excepted from the prohibition are fast freight and cattle. The

regulations issued for the enforcement of article 4 say "provision must be made that the rest days may be spent at the place of residence; they shall comprise 24 full hours and shall not be shortened, neither at the time of ceasing, nor at the time of beginning work."

Subsequent investigations showed that the law was well observed, the suppression of Sunday freight making it easier of enforcement.

#### CANTON OF APPENZELL ON RHINE.

*Act of April 26, 1908, E. B. III, pp. 124-126.*

Female hotel servants must be allowed a daily period of rest of at least 8 hours between 3 p. m. and 8 a. m., and are entitled to a weekly rest period of at least 6 hours between 8 a. m. and 8 p. m. In lieu of foregoing, servants may contract to receive five days' leave, with full pay, twice each year.

No. 22: In shops which are open on Sundays, the women employees shall have a period of rest during the week, equal to the time worked on Sunday.

#### CITY OF BASEL.

*Law concerning Sunday rest, June 20, 1909.*

(Sociale Rundschau, herausgegeben vom Arbeitsstatistischen Amt im Handelsministerium, Vienna, Austria, Sept. 1909, p. 249.)

1. Good Friday, Easter, the Pentecost; the day of prayers and Christmas; all Sundays; the first day of the year; Easter Monday; the feast of the Assumption, the Monday of the Pentecost, and the day after Christmas, when not Tuesday, are considered official rest days.

3. There is prohibited on rest days noisy work or any noise near church during religious services, public parades, the employment and the paying off of employees in industrial, manufacturing and mercantile establishments, all agricultural work not required to be performed daily, or not depending on events of nature



or the weather; transportation; peddling, stocking up, auction sales, and hunting and trading.

5. As far as employment is allowed on rest days, the following provisions are binding:

a. If regularly employed on rest days, employees are entitled to one full day of rest at least every two weeks. Besides one full day of rest at least every two weeks,—on weeks during which employees do not obtain a full day of rest, the rest that has been lost through Sunday or holiday work must be given to them on a week day, and in case this is not sufficient, on two weeks days. For holidays and during the time of the fair, the government may order the replacing of rest lost through Sunday and holiday work by rest on week days, also the delaying and bunching of rest days.

b. Employees working regularly on rest days may agree in writing with employers that at the most, half of the free time they are entitled to during the week shall be delayed and allowed in an uninterrupted vacation, but the remainder of the free time shall be divided as evenly as possible. The entire amount of resting time to which employees are entitled shall be allowed within periods of three, six, or twelve months.

c. If regular employment on legal rest days is not exceeding two hours, and employees are allowed a full day of rest each second week, employees may enter into a written agreement with employers to be indemnified in cash for lost time of rest.

d. For extra work on legal rest days the employees are to be indemnified either in free time or in cash.

S7: Domestic and agricultural servants are to be allowed every week, on a legal rest day or on a week day, at least six hours of free time between 7 a. m. and 9 p. m. and of these, four hours must be without interruption.

## CANTON OF TOWN OF BASEL.

*Act to amend the hotels and public houses; Act of December 19, 1887, and June 8, 1905. Jan'y 14, 1909. E. B. IV, p. 52.*

29b. Every employee in hotels and public houses must have at least 8 hours of uninterrupted rest in 24.

In addition, each employee must have a period of leisure each week between the hours of 8 a. m. and 10 p. m. of at least 6 hours on one day, or at least 4 hours on each of two days.

Each month there is to be holiday of at least 24 consecutive hours, or not more than 6 such holidays may be combined from time to time in one continuous holiday. In the weeks when the 24 hour holiday occurs, the weekly rest period of 6 hours or the two rest periods of 4 hours each, as the case may be, need not be allowed.

*E. B. I, p. 564. General Service Regulation for Employees in Government Service. July 28, 1906.*

Section 12: Workmen who have to work several hours on Sunday shall have equivalent period off on some other day in week. Each employee shall have a Sunday holiday 26 times during the year.

## BERNE.

*Act of the Grand Council of Nov. 27, 1907. Adopted by Referendum on Feby. 23, 1908. E. B. III, p. 118.*

17. Female shop assistants may be permitted to work on Sundays, but they must have a corresponding rest period during the week, and one free Sunday in every month.

## CANTON OF LUCERNE.

*E. B. I, p. 65. Apprenticeship Act, March 6, 1906.*

Part III, Section 12: In establishments where Sunday work is unavoidable State Council may grant permission to male apprentices to work Sundays. But there must be ten hours unbroken rest in twenty-four and extra leisure must be granted to make up for hours worked on Sunday.

## CANTON OF TESSIN.

*E. B. I, p. 210. Decree of July 3, 1906, prohibiting night work in bakeries, etc.*

Section 6. Provides that hours of work shall not exceed eleven in twenty-four, and each employee shall have one day of rest a week. At least once a month the rest day shall fall on Sunday or a holiday.

*Act respecting work in bakehouses and pastry-cooks businesses, June 19th, 1908. E. B. IV, p. 54.*

4. Every workman has a right to a weekly holiday, which must fall on a festival at least once a month. Workmen may be employed for one hour on holidays, however, for the purpose of preparing fresh dough.

## CANTON OF THURGAU.

*Hotels and Public Houses Act, March 12, 1906, adopted by referendum, May 20, 1906. E. B. I, p. 568.*

"All employees shall have the right \* \* \* to one half-holiday in the week, which must fall on Sunday morning or afternoon at least once in the month."

## CANTON OF ZURICH.

*Act of May 27, 1907. E. B. I., p. 296.*

Declares Sundays and seven festivals to be public holidays. Prohibits employment on holidays in industrial or commercial establishments, in any trade or handicraft, noisy occupations, or the making up of accounts. Exceptions allowed in the case of agriculture, continuous processes, industries serving daily needs, stock-taking and emergency work. Sunday work restricted to certain hours in hairdressing and photography. Regulation of Sunday work of porters, cabdrivers, pleasure-boat owners and in bathing establishments left to local authorities. Employees in certain industries who work a part of Sundays must have every third Sunday free, and for each Sunday worked, must have a free afternoon during same week.

There has been, so far, little discussion of the new rest-day laws. The French law has received some attention, and it seems to be defective chiefly in its tendency to leave to the executive the specific classification of certain trades and in its failure to provide adequate machinery for its enforcement. This latter gave rise to friction, for a time, because some retail stores did not obey the law and thus had an advantage over those who closed on Sunday. Another serious objection arose over the reduction in earnings of the workmen formerly employed seven days in the week, and numerous strikes occurred during the autumn of 1906. Two years later this matter had been adjusted so that in industries where continuous work had to be done, in a majority of cases the labor force had been increased a seventh and thus output was kept up to the former level and daily wages had gone up in the same degree.

## 4. COMMUNICATIONS.

HEALTH DEPARTMENT, NEW YORK STATE.

MR. ABRAM I. ELKUS,

*Chief Counsel, Factory Investigating Commission,  
170 Broadway, New York City:*

DEAR SIR:

Your communication of recent date, asking for a statement in reference to the investigation being carried on by your Commission, was forwarded to me during my absence from Albany and I regret to say that for this reason there was delay in its delivery.

I have been, and am, much interested in the work which your Commission has undertaken, and am glad to note that there is a movement on foot to extend the time within which your Commission may report, to enable you to go more thoroughly into some of the questions at issue.

I shall endeavor to answer the questions which you have put to me and can assure you that I will be glad to co-operate with the Commission in any way in its work, or to furnish you any information in my power.

As to the jurisdiction of this Department over manufacturing establishments, I beg to say that contrary to general public opinion, the direct powers of this Department are exceedingly limited. Most of the authority in regard to public health matters lies with the local Boards of Health, and as I have pointed out for some years, I believe New York State is far behind in failing to put sufficient authority in the hands of the State Department of Health to inaugurate many radical reforms which are needed and which it is apparent can never be carried out by local Boards of Health.

We have no direct authority over the conditions in manufacturing establishments, nor have we attempted to make inspections of the same. We have very little money to expend in inspection work, and it is necessary that the men so employed should be kept busy on work in the protection of public water supplies and matters of this kind where the Department is charged with responsibility.

The questions as to the improvements necessary to reduce the heavy mortality from tuberculosis and other diseases among factory

workers and the causes of this disease go to the root of our social conditions. It is obvious that the employer of labor should be required to keep his premises in a sanitary condition, to make the premises as safe as possible for his employees, that persons afflicted with contagious diseases should not be allowed to spread the same by contact with others, and that the health and efficiency of the workers should be maintained at as high a standard as possible, and that it is to the advantage of the employer to see that this is done.

While our figures in regard to the cases of tuberculosis are not complete, the disease never having been required to be reported in this State until I placed it upon the list of diseases to be reported, in 1907, we know that there is a heavy mortality among factory workers and in certain cities of the State where there are large manufacturing establishments. The living conditions must be improved, as well as the conditions under which these people work, if we are to successfully combat the disease. Insanitary tenements must be abolished and the worker must receive a wage sufficient to enable him to obtain proper food. He must be educated as to the steps necessary to prevent tuberculosis, the dangers of alcoholism, and the necessity of rest, fresh air and good food in maintaining his strength and efficiency.

It will readily be seen that the subjects involved require co-operation and consideration on the part of the State, the municipality, the employer and civic associations. The efforts of this Department in regard to tuberculosis during the past few years have been directed along the lines of a widespread educational campaign to teach the people what the disease is, how it should be prevented, and its cure. Our experience leads us to believe that what people are in need of is an opportunity to learn about matters of this kind, and that if the State will furnish this information they will grasp it eagerly.

In regard to mortality and morbidity statistics, I would say that our mortality statistics have been very much improved in the last few years as we have secured a number of amendments to our law, and we have a complete registration of all deaths. Morbidity statistics are not as complete, owing to the difficulty in getting local Boards of Health to get physicians to report all cases. We are endeavoring to interest the physicians throughout the State in this

work, and to require local Boards of Health to compel the reporting of all cases. I believe this question is largely an educational one and more direct results can be secured by getting the co-operation of the physicians than by attempting to force them into line.

As to the functions of the State Health Department and the State Department of Labor, concerning the sanitary conditions in factories, it would seem that as the State Labor Department is vested with general authority over these plants, the authority governing sanitary conditions should also be given to them and that they should have proper funds to require its enforcement.

As to the co-operation between the State Department of Health and local Boards of Health, I beg to say that it our endeavor to co-operate with local Boards of Health in all matters, and to endeavor to assist them and advise them in their undertakings. We have very little control over their acts and have great difficulty in compelling them to carry out some of the provisions of the Public Health Law.

It is our purpose to introduce at this session of the Legislature a bill making some general amendments to the Public Health Law in which we propose to strengthen the authority of the State Department of Health over the local Boards and secure a more effective co-operation.

As to the necessity for a State Sanitary Code, I do not believe it is feasible to attempt to do this. All of our local Boards of Health have rules and regulations. They must be drafted to suit many varying conditions, and in the majority of the jurisdictions the regulations are sufficient to protect the public health if they are properly enforced.

I beg to assure you of my deep interest in the work of your Commission and my desire to be of every possible service, and if there is any further information I can give you I will be very glad to furnish it.

Thanking you for the opportunity of addressing you, I am,

Very Respectfully,

EUGENE H. PORTER,

*Commissioner of Health.*

## BAKERIES.

OFFICE OF THE COMMISSIONER OF HEALTH.

*January 4, 1912.*

MR. ABRAM I. ELKUS, *Chief Counsel, Factory Investigating Commission, No. 165 Broadway, New York.*

SIRS:

In reply to your letter of December 26, 1911, I beg to advise you as follows in answer to your several questions:

During the year ending October 1, 1911, 3,042 inspections of bakeries were made; 744 reports were referred to the State Department of Labor, in 571 instances unclean conditions were removed by the personal effort of the inspectors or patrolmen of the Sanitary Squad, and 60 notices were issued by the Department.

During the period from October 1, 1911, to December 15, 1911, 3,824 investigations of bakeries were made; unclean conditions were removed by the personal effort of inspectors or patrolmen of the Sanitary Squad in 666 instances; 123 notices were issued by the Department; 192 "public nuisance" orders and 95 "vacation" orders were issued by the Board of Health against bakeries.

The Department of Health has no authority to "seal" bakeries.

Very truly yours,

ERNST J. LEDERLE,

*Commissioner.*



## EMPLOYMENT OF PREGNANT WOMEN.

*Jahua: y 26th, 1912.*

MR. ABRAM I. ELKUS,

*170 Broadway, N. Y.*

DEAR SIR:

I presented your letter of the 18th at the meeting of the Brooklyn Pediatric Society in connection with the discussion of a paper on "The Cause and Prevention of Premature Birth." There was a very general and interesting discussion of your plans, and at my motion the following resolutions were unanimously adopted. Make use of them in any way that seems wise.

"Whereas, The statistics collected by many investigators, both in this country and abroad, conclusively prove that factory labor is responsible for a large percentage of prematurity and infant mortality; Be it resolved, That the Brooklyn Pediatric Society heartily endorses the efforts of the Factory Investigating Commission to regulate, by law, the employment of women immediately before and after childbirth."

Practically all who discussed the question agreed with you that it would be difficult or impossible to do much in the way of prevention before childbirth. They also wanted me to express to you their opinion that we should shorten, by law, the working-day for women.

Another point was that the State must supply some way of taking care of such women if they are not allowed to work.

Yours truly,

LOUIS C. AGER.

## HEALTH INSPECTION IN FACTORIES.

HEALTH DEPARTMENT, MASSACHUSETTS.

BOSTON, *Sept. 25, 1911.*

DR. GEORGE M. PRICE,

*Director of Investigations,**Factory Investigating Commission,**165 Broadway, New York, N. Y.*

MY DEAR DR. PRICE:

I have your letter of September 23 requesting copies of inspection cards and schedules used by our inspectors. While I am sending them under separate cover, I wish I might see you to explain how they are used, as otherwise I feel that you will get but slight help from them. I am also inclosing a copy of the 1906 report of this board relating to the sanitation of factories.

Since you ask for suggestions, in addition to the printed matter, the suggestion which I would offer is one which is the outcome of seven years' experience in the work in Massachusetts. In this State, a distinction is made between "factory inspection" and "health inspection in factories." Factory inspection, except for a study of the health conditions in factories and the health of the persons employed therein, is in the hands of the district police, while the health inspection work is under the supervision of the State Board of Health. In considering the protection of the public health, we recognize that the factory is not an isolated part of the community, that in manufacturing centers factory employees mingle freely with persons in other walks of life, and that the health of persons who work in factories, therefore, may affect materially the health of the public. We recognize, too, that in making a study of the sanitation of factories and the probable effects of conditions, processes, and methods upon health, we must have a knowledge of the sanitation of each industrial community including the factory, the school and the home. For these reasons, the health inspection of the commonwealth includes the health inspection of industrial establishments and some knowledge of each industrial process and a study of the probable effects of occupation upon the health of the workers at their work, as well as

the investigation of the prevalence of communicable and occupational diseases.

So far as I know, Massachusetts stands alone in providing for such a thorough study of factory and industrial conditions, their probable effects upon the health of the workers and investigation of the prevalence of communicable and occupational diseases. In this latter work, our inspectors are empowered to make physical examinations of minors under eighteen years of age, not only for the purpose of excluding minors with dangerous diseases like tuberculosis, but for the purpose of excluding them from any occupation or process, condition or method which may injuriously affect their health.

A few words as to the history of the present system: the question of providing a body of health inspectors who should stand between the authorities at the State House and the municipalities first arose some twenty years ago. In 1904-5 and 6 a rather extensive investigation of health conditions of industrial life by the State Board of Health marked the first definite step in the development in America of industrial hygiene. Dr. Charles Harrington, then Secretary of this Board, realizing the importance of preventive medicine, and therefore of encouraging specialization in sanitary work, went so far as to announce to one of his classes in hygiene in the Harvard Medical School that only graduates of medicine would be eligible for the work. The result of the investigation warranted certain definite recommendations to the Legislature providing for a more efficient provision for the health of the operatives than at that time existed. This investigation, therefore, covering a period of three years, was one of the several influences that in 1907 affected the legislative mind. Another was a very strong organization of persons who were interested in the measures for the prevention of the spread of tuberculosis. In this year of 1907, therefore, the Legislature of Massachusetts passed an act which provided for the establishment of health districts and the appointment of State Inspectors of Health. There are fourteen State Inspectors of Health, each in charge of a health district, who are physicians legally recognized as sanitarians who work under the supervision of the State Board of Health, acting as an intermediary between the State Board and

the local boards. While the health district division is still experimental, the matter of determining the division lines and the power of changing them from time to time is left entirely to the State Board of Health. The State Inspectors of Health are appointed by the State Board of Health with the consent of the Governor and Council. While the term of office of a State Inspector of Health is designated as five years, he may be removed at any time by the State Board of Health. The important thing, in general terms, about the legislation, so far as it affects local health authorities, is that it is advisory. It is the business of a State Inspector of Health to assist the local health authorities within his district and when necessary, advise them relative to the prevention of the spread of diseases dangerous to the public health, and all influences dangerous to the public health or threatening to affect the same. A portion of the work relating to the health inspection of factories is of an executive nature, although as I have said, in other words, the purpose of inspecting the sanitary conditions in industrial establishments is to safeguard the health, first, of the workers, and, second, of the community at large. A proper study of occupational hygiene in each establishment, of course, involves a knowledge of the sanitary conditions, including the adequacy of lighting, the ventilation, and cleanliness of the establishment, as well as some knowledge of the various industrial processes in which the operatives are engaged. Such work, as conducted in this State, leads in every instance to practical results. If any unsanitary conditions are found, if any processes are conducted wherein employees are exposed to injurious influences, orders are issued; or, in case no specific statute covers the case, recommendations are made to provide for the necessary changes. Thus, the data relative to occupational diseases are of the utmost practical, immediate value, for in this way we find out what processes are dangerous and hence what processes must be protected.

I have gone into the matter in considerable detail, so as to point out what, so far as I know, all states except Massachusetts, fail to recognize, although a few are beginning to recognize it, that health inspection of industrial establishments and of persons employed therein is interrelated with community health inspection, and that any attempt to divide the two kinds of work, as for

example, by establishing two separate bureaus, interferes with and consequently weakens the health work of the State. While I appreciate the fact that the enforcement of many labor laws relating to factory work is by no means a part of the function of a health board, the results of health inspection in the factories of Massachusetts during the last seven years have gone beyond the experimental stage in showing the public that such work to be efficient and to best guard the public health must be under the supervision of the central health authority of the State.

Yours very truly,

WM. C. HANSON.

## FIFTH AVENUE ASSOCIATION.

NEW YORK, *December 15th, 1911.*

MR. ABRAM I. ELKUS, *Chief Counsel, Factory Investigating Commission, 165 Broadway, New York.*

DEAR SIR:—

“The members of The Fifth Avenue Association are in full sympathy with the purpose of this Commission to ascertain and establish the conditions attending manufacture in the cities of the first class and second class of the State, in order that the life and health of all those in all factory employment may be safeguarded, and that indeed the best and most complete measures of safety for these reasons shall be adopted and enforced. We believe through the facts which this Commission will bring out, that a most beneficial result will follow in improved and practical laws that will ensure the protection hitherto failing.

But there is another matter, vitally and intimately associated with conditions of manufacture in the city of New York.

I refer to the fact that factories now exist in large numbers in the cross streets directly adjacent to Fifth Avenue, and are growing in number so rapidly that many of the members of Fifth Avenue Association and other well-informed people to whom I have spoken, are gravely concerned regarding the maintenance of Fifth Avenue as a hotel, residential and avenue for shopping, in view of this invasion of factory employments into what may be designated the Fifth Avenue district. Fifth Avenue property values are founded for the chief part on the usage of property there situated for its present purpose, and its future value and the income are estimated upon the proposition that Fifth Avenue will retain unimpaired its prestige and the value and advantage it possesses to-day. I am not here to argue to this Commission that factories and lofts coming into this district may not be a sign of prosperity. It may well be that the choice of such location is determined by such natural uptown movement, and by the general increase in light manufacturing employment in this borough, and by many other complex conditions that make it useless to exclaim against

what is deemed a menace. I wish simply to state the fact that your Commission take these into account and make such further inquiry into the same recommendations as may be considered proper.

I wish to say that I am told that no manufacturing district and shopping district can exist in the identical same territory. Manufacturing always bringing the best property to its lowest value.

It is a matter of common knowledge that the receiving and shipping of goods for many of the loft buildings in which factory employments are carried on, notably in the streets in the twenties, between Fifth and Sixth Avenues and Broadway, which process is also growing in streets higher up, congest these cross streets to an extent that it imperils the regularity of foot and wagon traffic.

Any obstruction to the free movement of traffic leading to and from Fifth Avenue is of necessity harmful. In the absence of planning associations or of any law or laws which define or limit the right of manufacturing establishments, they can enter upon and occupy property anywhere to the ultimate destruction of an entire neighborhood.

We seriously recommend, in connection with your investigation, an inquiry whether it would be lawful and whether it would be for the general good to have factory employments kept within certain geographical limits within this, and perhaps, other Boroughs of the city. In view of the improved legislation demanded and which will undoubtedly flow from this investigation, I think that the choice of future location of factories on grounds and premises far less expensive than those in the Fifth Avenue district would lend itself to the requirements of more space for employees, more light, more ventilation and less height to buildings than is possible when the location is within the district."

Yours very truly,

ROBERT G. COOKE,

*President.*





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## BILLS SUBMITTED TO THE LEGISLATURE

- I.\* Fireproof Receptacles; Gas Jets; Smoking.
- II.\* Fire Drills.
- III.\* Automatic Sprinklers.
- IV. Fire-escapes and Exits.
- V. Limitation of Number of Occupants.
- VI. Fireproof Construction of Factory Buildings Hereafter Erected.
- VII.\* Unclean Factories; Summary Power of Commissioner of Labor.
- VIII.\* Registration of Factories.
- IX.\* Washing Facilities; Prohibition of Eating Meals in Factories Using Poisonous Substances.
- X. Ventilation where Dust, Gases and Fumes are Generated.
- XI. Bakeries, Licensing; New Cellar Bakeries Prohibited.
- XII. Seats for Women Employees.
- XIII.\* Employment of Women after Childbirth.
- XIV.\* Employment of Children; Physician's Certificate.
- XV. Brass, Steel, and Iron Foundries.

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\*Bills passed by the Legislature and signed by the Governor.  
The others will be revised and redrafted and submitted to the Legislature in January, 1913.



# BILLS SUBMITTED TO THE LEGISLATURE, EMBODYING THE RECOMMENDATIONS OF THE COMMISSION

Matter in *italics* is new; matter in brackets [ ] is old law to be omitted.

## I. FIRE PROOF RECEPTACLES; GAS JETS; SMOKING.

Section 1. Article six of chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," is hereby amended by inserting therein a new section, to be section eighty-three-c, to read as follows:

§ 83-c. *Fire proof receptacles; gas jets; smoking.* 1. *Every factory shall be provided with properly covered fire proof receptacles, the number, style and location of which shall be approved in the city of New York by the fire commissioner, and elsewhere, by the commissioner of labor. There shall be deposited in such receptacles all inflammable waste materials, cuttings and rubbish. No waste materials, cuttings and rubbish shall be permitted to accumulate on the floors of any factory but shall be removed therefrom not less than twice each day. All such waste materials, cuttings and rubbish shall be entirely removed from a factory building at least once in each day.*

2. *All gas jets or lights in factories shall be properly enclosed by globes, wire cages or otherwise properly protected in a manner approved in the city of New York by the fire commissioner of such city, and elsewhere, by the commissioner of labor.*

3. *Smoking in a factory is prohibited. A notice of such prohibition stating the penalty for violation thereof shall be posted on every floor of such factory in English and also in such other language or languages as the fire commissioner of the city of New*

*York in such city, and elsewhere, the state fire marshal, shall direct. The fire commissioner of the city of New York in such city, and elsewhere, the state fire marshal shall enforce the provisions of this subdivision.*

§ 2. This act shall take effect immediately.

## II. FIRE DRILLS.

Section 1. Article six of chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," is hereby amended by inserting therein a new section, to be section eighty-three-a, to read as follows:

§ 83-a. *Fire drills. In every factory in which more than twenty-five persons are regularly employed above the ground or first floor a fire drill of the occupants of such building shall be conducted at least once in every three months under the supervision of the local fire department or one of its officers. Appropriate rules and regulations to make effective this provision shall be prepared for the city of New York by the fire commissioner of such city, and for other parts of the state, by the state fire marshal. Such rules and regulations shall be posted on each floor of every factory to which they apply. In the city of New York the fire commissioner of such city, and elsewhere, the state fire marshal is charged with the duty of enforcing this section.*

§ 2. This act shall take effect immediately.

## III. AUTOMATIC SPRINKLERS.

Section 1. Article six of chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," is hereby amended by inserting therein a new section, to be section eighty-three-b, to read as follows:

§ 83-b. *Automatic sprinklers. In every factory building over seven stories or over ninety feet in height in which wooden*

*flooring or wooden trim is used and more than two hundred people are regularly employed above the seventh floor or more than ninety feet above the ground level of such building, the owner of the building shall install an automatic sprinkler system approved as to form and manner in the city of New York by the fire commissioner of said city, and elsewhere, by the state fire marshal. Such installation shall be made within one year after this section takes effect, but the fire commissioner of the city of New York in such city and the state fire marshal elsewhere may, for good cause shown, extend such time for an additional year. A failure to comply with this section shall be a misdemeanor as provided by section twelve hundred and seventy-five of the penal law and the provisions hereof shall also be enforced in the city of New York by the fire commissioner of such city in the manner provided by title three of chapter fifteen of the Greater New York charter, and elsewhere by the state fire marshal in the manner provided by article ten-a of the insurance law.*

§ 2. This act shall take effect immediately.

#### IV. FIRE-ESCAPES AND EXITS.

Section 1. Section eighty of chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," as amended by chapter four hundred and sixty-one of the laws of nineteen hundred and ten, is hereby amended to read as follows:

§ 80. Stairs and Doors. Proper and substantial handrails shall be provided on all stairways in factories. The steps of such stairs shall be covered with rubber, securely fastened thereon, if in the opinion of the commissioner of labor the safety of employees would be promoted thereby. The stairs shall be properly screened at the sides and bottom. All doors leading in or to any [such] factory in which less than twenty persons are employed on a floor shall be so constructed as to open outwardly where practicable [, and shall not]. Where more than twenty persons are employed on any one floor of a factory all doors on such floor or floors leading to exits must open outwardly or be so constructed

*as to slide freely.* No doors shall be locked, bolted or fastened during working hours. No door, window or other opening on any floor of any such factory shall be obstructed by stationary metal bars, grating or wire mesh. Any metal bars, grating, or wire mesh provided for any such doors, windows or openings, shall be so constructed as to be readily movable or removable from the interior in such a manner as to afford the free and unobstructed use of such doors, windows or opening for purposes of egress, in case of need.

§ 2. Section eighty-two of such chapter is hereby amended to read as follows:

§ 82. *Fire Escapes and Exits.* [Such fire escapes as may be deemed necessary by the commissioner of labor shall be provided on the outside of every factory in this state consisting of three or more stories in height. Each escape shall connect with each floor above the first, and shall be of sufficient strength, well fastened and secured, and shall have landings or balconies not less than six feet in length and three feet in width, guarded by iron railings not less than three feet in height, embracing at least two windows at each story and connected with the interior by easily accessible and unobstructed openings. The balconies or landings shall be connected by iron stairs, not less than eighteen inches wide, with steps of not less than six inches tread, placed at a proper slant and protected by a well-secured hand-rail on both sides, and shall have a drop ladder not less than twelve inches wide reaching from the lower platform to the ground.

The windows or doors to the landing or balcony of each fire escape shall be of sufficient size and located as far as possible, consistent with accessibility from the stairways and elevator hatchways or openings, and a ladder from such fire escapes shall extend to the roof. Stationary stairs or ladders shall be provided on the inside of every factory from the upper story to the roof, as a means of escape in case of fire.]

1. *Such fire escapes as may be deemed necessary by the fire commissioner of the city of New York and the commissioner of labor elsewhere in the state shall be provided on the outside of*

every factory. Each escape shall connect with each floor above the first and shall be of sufficient strength, well fastened and secured, and shall have landings or balconies not less than six feet in length and six feet\* in width, guarded by iron railings not less than three feet in height, embracing two windows at each story and connected with the interior by easily accessible and unobstructed openings. The balconies or landings shall be connected by iron stairs not less than eighteen inches wide, with steps of not less than six inches tread, placed at a proper angle to be determined by the fire commissioner or commissioner of labor as the case may be, and protected by a well-secured hand-rail on both sides, and shall have a goose-neck ladder or stairs leading from the top floor balcony to and above the roof and properly fastened thereto, and a balanced drop ladder from the lowest balcony not less than twelve inches wide of sufficient length to reach to a safe landing place beneath. Except in the case of party wall fire escapes, and fire escapes erected on the front of a factory, safe and unobstructed exits shall be provided from such landing place either by means of an opening in the fence leading to adjoining premises or to fire proof passage ways leading to the street. All fire escapes and balconies thereof shall be constructed in accordance with such regulations as may be adopted in the city of New York by the fire commissioner and elsewhere in the state by the commissioner of labor.

2. All windows and doors leading to outside fire escapes in existing factories and those hereafter erected shall be not less than two feet in width by five feet in height and shall be constructed of wired glass. In all such factories all exits leading from work rooms including those leading to outside fire escapes and interior stairways shall be properly indicated by posting suitable signs thereat; all doors and sashes of windows leading to fire escapes shall be painted with red paint; access to outside fire escapes from the floor on which they are located and from the upper to the lower story shall not be obstructed in any way; there shall be free and easy access to all window sills leading to outside fire escapes, and if the distance from the floor to such window sill is more than two and one-half feet a proper step or steps leading thereto sufficient for free access and passage shall be pro-

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\*Should be four feet in width.

*vided. Stationary stairs or ladders shall be on the inside of every factory from the upper floor to the roof as a means of escape in case of fire. In all such factories where more than twenty-five persons are employed on any one floor, all doors and door-ways on such floor or floors leading to outside fire escapes or interior stair ways shall be not less than three feet wide.*

*3. Operatives in a factory shall be so placed or seated, and machines, machinery, merchandise and other articles so spaced or arranged, as to afford to each and every employee a continuous, safe and unobstructed passageway to every exit including those leading to outside fire escapes or interior stairways.*

*4. In all existing factories in which more than fifty persons are employed above the ground floor or first floor and in which there are unenclosed wooden stairways or stairways unenclosed by walls or partitions of fire proof construction, such stairways shall be properly enclosed by partitions of fire proof or fire resisting material with doors leading from the workrooms to such stairways of suitable fire proof construction, in the form and manner approved in the city of New York by the superintendent of buildings and fire commissioner, and elsewhere, by the commissioner of labor, and the local officer, if any, required to approve plans for the construction and alteration of buildings. There shall also be erected on the outside of all such factories fire escapes constructed in accordance with the requirements of subdivision one hereof.*

*5. The provisions of this section shall apply throughout the state, but the jurisdiction of the commissioner of labor shall not extend to the enforcement in the city of New York of the provisions of subdivisions one, two and four. The commissioner of labor shall have power to make rules and regulations for the enforcement of subdivision three throughout the entire state. The provisions of subdivision four shall be complied with within one year, but the fire commissioner in the city of New York, and the commissioner of labor, elsewhere, may, for good cause shown, extend such time for a further period not exceeding one year. In addition to the remedy provided by section twelve hundred and*



*seventy-five of the penal law, the fire commissioner in the city of New York in enforcing the provisions of this section in such city shall have all the powers conferred upon him by title three of chapter fifteen of the Greater New York Charter. In addition to any other remedy, or power, elsewhere in the state, the officer having authority to enforce the provisions of this section, if an order of such officer requiring compliance with any provision hereof be not complied with within twenty days, may apply to the supreme court at a special term thereof, upon such notice as the court shall prescribe, for an order directing such officer to vacate the factory, or so much thereof as such officer may deem necessary, and prohibiting and enjoining all persons from using or occupying the same until such measures are taken as may be required by the order of such officer.*

§ 3. This act shall take effect immediately.

## V. LIMITATION OF NUMBER OF OCCUPANTS OF FACTORY BUILDINGS.

Section 1. Article six of chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," is hereby amended by inserting therein two new sections, to be sections eighty-three-d and eighty-three-e thereof, to read as follows:

§ 83-d. *Limitation on number of occupants. The number of persons who may occupy any floor in a factory above the ground or first floor shall be as follows:*

1. *Not more than fourteen persons shall be employed on each floor for every eighteen inches in width of stairway provided. For every additional sixteen inches over ten feet in height of any floor, one additional person shall be allowed thereon.*

2. *Where there are landing places inclosed in fireproof walls or fireproof partitions and separated from the workroom or loft by fireproof doors of standard fireproof construction, such additional persons may be employed on each floor as will be accommodated*

by the landing place or places aforesaid on the basis of at least three square feet of unobstructed floor space in such landing place to each person.

3. Where a fire wall or walls with fireproof doors of standard fireproof construction not less than thirty-six inches in width are erected, such additional number of persons may be employed on each floor as can be accommodated in the smaller of the two spaces divided by the fire wall on the basis of at least three square feet of unobstructed floor area per person; provided that there shall be stairway facilities on each side of said fire wall and that the clear space on each side of the said fire wall is of sufficient area to accommodate the occupants of the adjoining space in addition to its own occupants on the basis of not less than three square feet of unobstructed floor area per person.

4. Where fireproof connections are made with an adjoining or nearby building either by an opening in the party wall having a fireproof door of standard fireproof construction not less than thirty-six inches in width, or by fireproof balconies from the exterior connecting the factory with an adjoining or nearby building, such additional number of persons may be permitted on each floor as can be accommodated in such adjoining or nearby building allowing three square feet of unobstructed floor area per person, provided that there shall be stairway facilities in such adjoining building and that the clear space in such building be of sufficient area to accommodate the occupants of the factory, in addition to its own occupants, on the basis of at least three square feet of unobstructed floor area per person.

5. Double the number of persons allowed under subdivision one of this section may be employed on each floor where there is constructed or installed on each and every floor of the factory building an automatic sprinkler system in the form and manner approved in the city of New York by the fire commissioner of such city, and elsewhere in the state by the state fire marshal.

6. There shall in any event and irrespective of the preceding provisions of this section be at least thirty-six square feet of

floor space on each and every floor of a non-fireproof factory building for every person employed therein and at least thirty-two square feet of such floor space per person in a fireproof building. A fireproof building is one that is constructed so that its walls are of brick, stone or concrete; its floors and roofs of brick, terra cotta, reinforced concrete, or other approved incombustible material placed between steel or reinforced concrete beams; all steel entering into its structural parts thoroughly encased in at least two inches of fire resisting material; its interior partitions entirely of incombustible materials; its stairways and stairway landing entirely of brick, stone, concrete, iron or steel; and all stairways, elevators and other vertical communications between floors solidly enclosed in shafts of fireproof construction.

7. The provisions of this section shall be complied with within one year after it takes effect, but the fire commissioner of the city of New York, in such city, and the state fire marshal\* elsewhere, may, for good cause shown, extend such period not exceeding one year.

8. The provisions of this section shall apply throughout the state and they shall be enforced in the city of New York by the fire commissioner of such city, and elsewhere in the state by the commissioner of labor. In addition to the remedy provided by section twelve hundred and seventy-five of the penal law, the fire commissioner in the city of New York in enforcing the provisions of this section, in such city, shall have all the powers conferred upon him by title three of chapter fifteen of the Greater New York charter. Elsewhere in the state, in addition to any other remedy or power, the officer having authority to enforce the provisions of this section, if an order of such officer requiring compliance with any provision hereof be not complied with within twenty days, may apply to the supreme court at a special term thereof, upon such notice as the court shall prescribe, for an order directing such officer to vacate the factory or so much thereof as such officer may deem necessary, and prohibiting and enjoining the employment therein of more than the number of persons specified in the order of such officer.

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\*Should be Commissioner of Labor.

§ 83 e. *Posting.* In every factory in which more than fifty persons are employed above the ground or first floor, the fire commissioner of the city of New York, in such city, and the commissioner of labor elsewhere in the state shall cause to be posted, notices specifying the number of persons that may occupy each floor thereof. One such notice shall be posted in a conspicuous place near the entrance door to each floor and in each work-room. If any floor is occupied by more than one tenant, two such notices are to be posted in the space occupied by each tenant. Every such notice shall bear the date when posted. If more persons occupy any floor or floors than are specified in the said notices, the fire commissioner of the city of New York and the commissioner of labor, as the case may be, shall issue an order to the tenant or tenants thereof and to the owner of the building directing that the number of occupants of said floor or floors be reduced to the number specified in the order.

§ 2. This act shall take effect immediately.

## VI. FIREPROOF CONSTRUCTION OF FACTORY BUILDINGS HEREAFTER ERECTED.

Section 1. Article six of chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," is hereby amended by inserting therein a new section to be section eighty-three-f, to read as follows:

§ 83-f. *Construction of factory buildings.* A building over two stories in height hereafter erected and in which more than twenty-five persons shall be employed shall not be used for factory purposes, unless such building be of fireproof construction, with the floors, doors, trims, partitions and entire interior finish of fire resisting material. If a building be used as a factory in violation of this section the commissioner of labor in addition to any other remedy or power may apply to the supreme court, at a special term thereof, without notice, for an order prohibiting and enjoining all persons from using and occupying such building for factory purposes.

§ 2. This act shall take effect immediately.

VII. UNCLEAN FACTORIES. SUMMARY POWER  
FOR COMMISSIONER OF LABOR.

Section 1. Section ninety-five of chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," is hereby amended to read as follows:

§ 95. Unclean [tenant] factories. If the commissioner of labor finds evidence of contagious disease in any [tenant] factory [in which any of the articles enumerated in section one hundred hereof are manufactured, altered, repaired or finished] he shall affix to any [such] articles *therein* exposed to such contagion a label containing the word "unclean" and shall notify the local board of health, who may disinfect such articles and thereupon remove such label. If the commissioner of labor finds *that* [any of the articles specified in said section in] any work-room or factory [in a tenant factory which] is foul, unclean, or unsanitary, he may, after first making and filing in the public records of his office a written order stating the reasons therefor, affix to [such] *any* articles *therein found* a label containing the word "unclean." No one but the commissioner of labor shall remove any label so affixed; and he may refuse to remove it until such articles shall have been removed from such factory and cleaned, or until such room or rooms shall have been cleaned or made sanitary.

§ 2. This act shall take effect immediately.

## VIII. REGISTRATION OF FACTORIES.

Section 1. Article six of chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," is hereby amended by inserting therein immediately preceding section seventy a new section, to be section sixty-nine, to read as follows:

§ 69. *Registration of factories. The owner of every factory shall register such factory with the state department of labor, giving the name of the owner, his home address, the address of*

*the business, the name under which it is carried on, the number of employees and such other data as the commissioner of labor may require. Such registration of existing factories shall be made within six months after this section takes effect. Factories hereafter established shall be so registered within thirty days after the commencement of business. Within thirty days after a change in the location of a factory the owner thereof shall file with the commissioner of labor the new address of the business, together with such other information as the commissioner of labor may require.*

§ 2. This act shall take effect immediately.

#### IX. WASHING FACILITIES AND EATING IN FACTORIES USING POISONOUS SUBSTANCES.

Section 1. Section eighty-eight of chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," as amended by chapter two hundred and twenty-nine of the laws of nineteen hundred and ten, is hereby amended to read as follows:

§ 88. Drinking water, wash-room and water-closets. In every factory there shall be provided at all times for the use of employees, a sufficient supply of clean and pure drinking water. Such water shall be supplied through proper pipe connections with water mains through which is conveyed the water used for domestic purposes, or, from a spring or well or body of pure water; if such drinking water be placed in receptacles in the factory, such receptacles shall be properly covered to prevent contamination and shall be thoroughly cleaned at frequent intervals. In every factory there shall be provided and maintained for the use of employees, suitable and convenient wash-rooms, adequately equipped with sinks and proper water service; *and in all factories where lead, arsenic or other poisonous substances or injurious or noxious fumes, dust or gases are present as an incident or result of the business or processes conducted by such factory there shall be provided washing facilities which shall include hot water and individual towels.* Where females are employed, dressing or emergency rooms shall be provided for their use; each such room shall have at

least one window opening to the outer air and shall be enclosed by means of solid partitions or walls. In brass and iron foundries suitable provision shall be made and maintained for drying the working clothes of persons employed therein. In every factory there shall be provided suitable and convenient water-closets for each sex, in such number as the commissioner of labor may determine. Such water-closets shall be properly screened, lighted, ventilated and kept clean and sanitary; the enclosure of each closet shall be kept clean and sanitary and free from all obscene writing or marking. The water-closets used by females shall be entirely separated from those used by males and the entrances thereto shall be effectively screened. The water-closets shall be maintained inside the factory whenever practicable and in all cases, when required by the commissioner of labor.

§ 2. Such chapter is hereby amended by adding thereto, after section eighty-nine, a new section, to be section eighty-nine-a, to read as follows:

§ 89-a. *Prohibition against eating meals in certain workrooms.* No employee shall take or be permitted to take any food into a room or apartment in a factory, mercantile establishment, mill or workshop, commercial institution or other establishment or working place where lead, arsenic or other poisonous substances or injurious or noxious fumes, dust or gases exist in harmful conditions or are present in harmful quantities as an incident or result of the business conducted by such factory, commercial establishment, mill or workshop, commercial institution or other establishment or working place; and notice to the foregoing effect shall be posted in each such room, or apartment. No employee, unless his presence is necessary for the proper conduct of the business, shall remain in any such room, apartment or enclosure during the time allowed for meals, and suitable provision shall be made and maintained by the employer for enabling employees to take their meals elsewhere in such establishment.

§ 3. This act shall take effect October first, nineteen hundred and twelve.

## X. VENTILATION WHERE DUST GASES AND FUMES ARE GENERATED.

Section 1. Section eighty-six of chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," is hereby amended to read as follows:

§ 86. Ventilation. The owner, agent or lessee of a factory shall provide, in each workroom thereof, proper and sufficient means of ventilation, and shall maintain proper and sufficient ventilation; if excessive heat be created or if steam, gases, vapors, dust or other impurities that may be injurious to health be generated in the course of the manufacturing process carried on therein *proper hoods and pipes connected with an exhaust fan of sufficient capacity and power to remove such dust or impurities at their point of origin and prevent them from mingling with the air in the room, shall be provided. Such fan shall be kept running constantly while the dust, gases and fumes are being generated.* [the room must be ventilated in such a manner as to render them harmless, so far as is practicable; in] In case of failure the commissioner of labor shall order such ventilation to be provided. Such owner, agent or lessee shall provide such ventilation within twenty days after the service upon him of such order, and in case of failure, shall forfeit to the people of the state, ten dollars for each day after the expiration of such twenty days, to be recovered by the commissioner of labor.

§ 2. This act shall take effect immediately.

## XI. BAKERIES, LICENSING. NEW CELLAR BAKERIES PROHIBITED.

Section 1. Article eight of chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," as amended by chapter six hundred and thirty-seven of the laws of nineteen hundred and eleven, is hereby amended by inserting therein a new section, to be section one hundred and eleven-a, to read as follows:



§ 111-a. *Licensing of bakeries.* 1. Every bakery, except as provided in this section, shall be licensed by the state department of labor. Application for such license shall be made to the commissioner of labor by the owner of such bakery, or by his duly authorized agent, stating the full name and address of the owner of such bakery, the location thereof and such other facts as the commissioner of labor may require. The application shall be in such form as the commissioner of labor may determine and blank applications shall be prepared and furnished by him.

2. Upon the receipt of such application the commissioner of labor shall cause a copy thereof to be transmitted to the department of health, board of health or other board or officer vested with the authority of enforcing the health laws in the city, town or village in which the bakery is located. Such department of health, board of health or other board or officer shall forthwith cause an inspection to be made of such bakery. If it is found in a sanitary condition and complies with the local health ordinances, orders and regulations, such department, board or officer shall file a certificate of approval to that effect with the state commissioner of labor. If such certificate be refused, a statement of the reasons therefor shall in like manner be filed with the commissioner of labor.

3. Upon the receipt of an application for a license under this section, the commissioner of labor shall, within thirty days thereafter, cause an inspection to be made of such bakery. If after such inspection he determine that the bakery complies with the requirements and provisions of this chapter, and the certificate of approval hereinbefore required has been filed with him, the commissioner of labor shall issue a license therefor. Such license shall be for one year and shall be annually renewed.

4. Such a license may be revoked by the commissioner of labor if at any time an order of the commissioner requiring compliance with any of the provisions of this chapter be not complied with within ten days, or if the bakery is not in a proper sanitary condition or the health of the community or of the employees require it. If a license be revoked or denied by the commissioner of labor, the

*reasons therefor shall be stated in writing and filed in his office, and the records of such revocation or denial shall be deemed public records. A license when issued shall be posted in a conspicuous place in the bakery.*

*5. No existing bakery shall be conducted without a license after the first day of October, nineteen hundred and twelve. An application for a license for such a bakery shall be made within thirty days after this section takes effect. If a new bakery be established application for a license shall be made within thirty days thereafter, and such a bakery shall not be conducted without a license after the expiration of sixty days from the establishment thereof.*

*6. A bakery shall not be located in a cellar and a license shall not be issued for a bakery so located, unless established and maintained as such at the time this section takes effect.*

*7. If a bakery be not licensed as required by this section, the commissioner of labor shall forthwith fasten up and seal the oven and other apparatus in such bakery in the manner provided by section one hundred and fourteen of this chapter, and such seals shall not be removed or the premises used as a bakery until a license therefor has been obtained pursuant to this section.*

*8. The provisions of this section shall not apply to hotels, restaurants or boarding houses.*

§ 2. This act shall take effect immediately.

## XII. SEATS FOR WOMEN EMPLOYEES.

Section 1. Section seventeen of chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," is hereby amended to read as follows:

§ 17. Seats for female employees. Every person employing females in a factory or as waitresses in a hotel or restaurant shall provide and maintain suitable seats *with backs at an angle of not*

*less than one hundred degrees for the use of such female employees, and permit the use thereof by such employees to such an extent as may be reasonable for the preservation of their health. Wherever practicable or where processes are adapted to a sitting posture, suitable seats with backs at an angle of not less than one hundred degrees shall be supplied for the use of all female employees while at work.*

§ 2. This act shall take effect October first, nineteen hundred and twelve.

### XIII. EMPLOYMENT OF WOMEN AFTER CHILD-BIRTH.

Section 1. Chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," is hereby amended by adding thereto, after section ninety-three, a new section, to be section ninety-three-a, to read as follows:

§ 93-a. *Employment of females after childbirth prohibited. It shall be unlawful for the owner, proprietor, manager, foreman or other person in authority of any factory, mercantile establishment, or mill or workshop to knowingly employ a female or permit a female to be employed therein within four weeks after she has given birth to a child.*

§ 2. This act shall take effect immediately.

### XIV. EMPLOYMENT OF CHILDREN. PHYSICIANS' CERTIFICATE.

Section 1. Subdivision (e) including the ensuing final paragraph of section seventy-one of chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," is hereby amended to read as follows:

(e) Physicians' certificates. In cities of the first class only, in case application for the issuance of an employment certificate shall be made to such officer by a child's parent, guardian or cus-

todian who alleges his inability to produce any of the evidence of age specified in the preceding subdivisions of this section, and if the child is apparently at least fourteen years of age, such officer may receive and file an application signed by the parent, guardian or custodian of such child for physicians' certificates. Such application shall contain the alleged age, place and date of birth, and present residence of such child, together with such further facts as may be of assistance in determining the age of such child. Such application shall be filed for not less than ninety days after date of such application for such physicians' certificate, for an examination to be made of the statements contained therein, and in case no facts appear within such period or by such examination tending to discredit or contradict any material statement of such application, then and not otherwise the officer may direct such child to appear thereafter for physical examination before two physicians officially designated by the board of health, and in case such physicians shall certify in writing that they have separately examined such child and that in their opinion such child is at least fourteen years of age such officer shall accept such certificates as sufficient proof of the age of such child for the purposes of this section. In case the opinions of such physicians do not concur, the child shall be examined by a third physician and the concurring opinion shall be conclusive for the purpose of this section as to the age of such child.

Such officer shall require the evidence of age specified in subdivision (a) in preference to that specified in any subsequent subdivision and shall not accept the evidence of age permitted by any subsequent subdivision unless he shall receive and file in addition thereto an affidavit of the parent showing that no evidence of age specified in any preceding subdivision or subdivisions of this section can be produced. Such affidavit shall contain the age, place and date of birth, and present residence of such child, which affidavit must be taken before the officer issuing the employment certificate, who is hereby authorized and required to administer such oath and who shall not demand or receive a fee therefor. Such employment certificate shall not be issued until such child further has personally appeared before and been examined by the officer issuing the certificate, and until such officer shall, after making

such examination, sign and file in his office a statement that the child can read and legibly write simple sentences in the English language and that in his opinion the child is fourteen years of age or upwards and has reached the normal development of a child of its age, and is in sound health and is physically able to perform the work which it intends to do. [In doubtful cases such physical fitness shall be determined by a medical officer of the board or department of health.] Every such employment certificate shall be signed, in the presence of the officer issuing the same, by the child in whose name it is issued. *In every case, before an employment certificate is issued, such physical fitness shall be determined by a medical officer of the department or board of health, who shall make a thorough physical examination of the child and record the result thereof on a blank to be furnished for the purpose by the state commissioner of labor and shall set forth thereon such facts concerning the physical condition and history of the child as the commissioner of labor may require.*

§ 2. Section seventy-five of such chapter is hereby amended to read as follows:

§ 75. Report of certificates issued. The board or department of health or health commissioner of a city, village or town, shall transmit, between the first and tenth day of each month, to the office of the commissioner of labor a list of the names of the children to whom certificates have been issued, *together with a duplicate of the record of the physical examination of all such children made as hereinbefore provided.*

§ 3. This act shall take effect immediately.

## XV. BRASS STEEL AND IRON FOUNDRIES.

Section 1. Chapter thirty-six of the laws of nineteen hundred and nine, entitled "An act relating to labor, constituting chapter thirty-one of the consolidated laws," is hereby amended by inserting therein a new section, to be section ninety-seven, to read as follows:

§ 97. *Brass, iron and steel foundries.* 1. *All entrances to foundries shall be so constructed and maintained as to minimize drafts, and all windows therein shall be maintained in proper condition and repair.*

2. *All passageways in foundries shall be constructed and maintained of sufficient width to make the use thereof by employees reasonably safe; during the progress of casting such passageways shall not be obstructed in any manner.*

3. *Smoke, steam and gases generated in foundries shall be promptly and effectively removed therefrom, and whenever it is necessary, exhaust fans of sufficient capacity and power, properly equipped with piping and hoods, shall be provided and operated to remove such smoke, steam and gases. The milling and cleaning of castings shall be done in rooms not otherwise used during the progress of such milling or cleaning and provision shall be made for confining and collecting the dust arising during the process.*

4. *All foundries shall be properly and thoroughly lighted during working hours and in cold weather proper and sufficient heat shall be provided and maintained therein. The use of heaters discharging smoke or gas into workrooms is prohibited. In every foundry employing five or more molders there shall be provided and maintained for the use of employees therein suitable and convenient washrooms adequately equipped with proper hot and cold water service; such washrooms shall be kept clean and sanitary and shall be properly heated during cold weather. Lockers shall be provided for the safe-keeping of employees' clothing and proper facilities shall be provided for drying the working clothes of employees. Water-closets used by foundry employees shall be so arranged or located that such employees in passing thereto or therefrom shall not be exposed to outdoor atmosphere, and such water closets shall be properly heated during cold weather.*

5. *The flasks, molding machines, ladles, cranes and apparatus for transporting molten metal in foundries shall be maintained*

*in proper condition and repair, and any such tools or implements that are defective shall not be used until properly repaired. There shall be in every foundry, available for immediate use, an ample supply of lime-water, olive oil, vaseline, bandages and absorbent cotton, to meet the needs of workmen in case of burns or other accidents; and any other equally efficacious remedy for burns may be substituted for those herein prescribed.*

§ 2. This act shall take effect immediately.












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